



Expansion of Hong Kong International Airport into a Three-Runway System

Construction Phase Quarterly EM&A Report
No.12 (1 October to 31 December 2018)

March 2019

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**This Construction Phase Quarterly EM&A Report No. 12 has been
reviewed and certified by**

the Environmental Team Leader (ETL) in accordance with

Section 15.4 of the Updated EM&A Manual

Certified by:

A handwritten signature in black ink, appearing to read 'Terence Kong', is positioned above a horizontal line.

Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date

7 March 2019



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By Email

Airport Authority Hong Kong
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Attn: Mr. Lawrence Tsui, Principal Manager

7 March 2019

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Quarterly EM&A Report No.12 (For 1 October 2018 to 31 December 2018)

Reference is made to the Environmental Team's submission of Quarterly EM&A Report No.12 (For 1 October 2018 to 31 December 2018) under section 15.4 of the Updated EM&A Manual certified by the ET Leader on 7 March 2019.

We would like to inform you that we have no adverse comment and verify the captioned submission.

Should you have any query, please feel free to contact the undersigned at 3922 9376.

Yours faithfully,
AECOM Asia Co. Ltd.

Jackel Law
Independent Environmental Checker

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Abbreviations

| | |
|-----------|---|
| 3RS | Three-Runway System |
| AAHK | Airport Authority Hong Kong |
| AECOM | AECOM Asia Company Limited |
| AFCD | Agriculture, Fisheries and Conservation Department |
| AIS | Automatic Information System |
| ANI | Encounter Rate of Number of Dolphins |
| APM | Automated People Mover |
| AW | Airport West |
| BHS | Baggage Handling System |
| CAP | Contamination Assessment Plan |
| CAR | Contamination Assessment Report |
| CTP | Coral Translocation Plan |
| CWD | Chinese White Dolphin |
| DCM | Deep Cement Mixing |
| DEZ | Dolphin Exclusion Zone |
| DO | Dissolved Oxygen |
| EAR | Ecological Acoustic Recorder |
| EIA | Environmental Impact Assessment |
| EM&A | Environmental Monitoring & Audit |
| EMIS | Environmental Mitigation Implementation Schedule |
| EP | Environmental Permit |
| EPD | Environmental Protection Department |
| ET | Environmental Team |
| FCZ | Fish Culture Zone |
| HKBCF | Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities |
| HKIA | Hong Kong International Airport |
| HSF | High Speed Ferry |
| IEC | Independent Environmental Checker |
| LKC | Lung Kwu Chau |
| MMHK | Mott MacDonald Hong Kong Limited |
| MMWP | Marine Mammal Watching Plan |
| MSS | Marine Surveillance System |
| MTRMP-CAV | Updated Marine Travel Routes and Management Plan for Construction and Associated Vessel |
| NEL | Northeast Lantau |
| NWL | Northwest Lantau |
| PAM | Passive Acoustic Monitoring |
| PVD | Prefabricated Vertical Drain |
| SC | Sha Chau |
| SCZ | Speed Control Zone |
| SCLKCMP | Sha Chau and Lung Kwu Chau Marine Park |
| SS | Suspended Solids |
| STG | Encounter Rate of Number of Dolphin Sightings |
| SWL | Southwest Lantau |

| | |
|------------------|---|
| The Manual | The Updated EM&A Manual |
| The Project | The Expansion of Hong Kong International Airport into a Three-Runway System |
| The SkyPier Plan | Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier |
| TSP | Total Suspended Particulates |
| WL | West Lantau |
| WMP | Waste Management Plan |

Executive Summary

The “Expansion of Hong Kong International Airport into a Three-Runway System” (the Project) serves to meet the future air traffic demands at Hong Kong International Airport (HKIA). On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the Project was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual (the Manual).

This is the 12th Construction Phase Quarterly EM&A Report for the Project which summarizes the monitoring results and audit findings of the EM&A programme during the reporting period from 1 October 2018 to 31 December 2018.

Key Activities in the Reporting Period

The key activities of the Project carried out in the reporting period included reclamation works and land-side works. Reclamation works included deep cement mixing (DCM) works, marine filling, seawall construction, laying of sand blanket, and prefabricated vertical drain (PVD) installation. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for Automated People Mover (APM) and Baggage Handling System (BHS), and preparation work for utilities, with activities include site establishment, site office construction, road and drainage works, cable ducting, demolition of existing facilities, piling, and excavation works.

EM&A Activities Conducted in the Reporting Period

The EM&A programme was undertaken in accordance with the Manual of the Project. Summary of the monitoring activities during this reporting period is presented as below:

| Monitoring Activities | Number of Sessions |
|---|--------------------|
| 1-hour Total Suspended Particulates (TSP) air quality monitoring | 96 |
| Noise monitoring | 52 |
| Water quality monitoring | 39 |
| Vessel line-transect surveys for Chinese White Dolphin (CWD) monitoring | 6 |
| Land-based theodolite tracking survey effort for CWD monitoring | 15 |
| Terrestrial ecology monitoring | 3 |
| Additional coral post-translocation monitoring | 1 |

Environmental auditing works, including weekly site inspections of construction works conducted by the ET and bi-weekly site inspections conducted by the Independent Environmental Checker (IEC), audit of SkyPier High Speed Ferries (HSF), audit of construction and associated vessels, and audit of implementation of Marine Mammal Watching Plan (MMWP) and Dolphin Exclusion Zone (DEZ) Plan, were conducted in the reporting period. Based on information including ET's observations, records of Marine Surveillance System (MSS), and contractors' site records, it is noted that environmental pollution control and mitigation measures were properly implemented

and construction activities of the Project in the reporting period did not introduce adverse impacts to the sensitive receivers.

Snapshots of Good Environmental Practices in the Reporting Period

| | | |
|--|---|---|
|  <p>Sorting facilities at TKOFB</p> |  <p>Monitoring of DEZs through CCTV system by contractor</p> |  <p>Environmental Recognition Scheme – effective dust suppression in tight work area and schedule environment</p> |
|--|---|---|

Key examples of good site practices implemented in the Project are highlighted here:

1. In order to maximize the utilization of public fill, the AAHK has been working closely with government departments in setting up sorting facilities in Tseung Kwan O Fill Bank (TKOFB) and Tuen Mun Fill Bank.
2. A contractor of DCM contract has started using technology-based solutions to implement DEZ monitoring. Combining the use of weatherproof and high image quality network cameras, and monitoring at site office, the solution has improved manpower deployment and monitoring during adverse weather.
3. The AAHK launched an Environmental Recognition Scheme for the Project since July 2018 to promote environmental awareness and good environmental practices in construction sites. Four contractors have been awarded for their good environmental performance.

Summary Findings of the EM&A Programme

The monitoring works for construction dust, construction noise, water quality, construction waste, landscape & visual, terrestrial ecology, and CWD were conducted during the reporting period in accordance with the Manual. An additional coral post-translocation monitoring survey was also conducted in the reporting period.

Monitoring results of construction dust, construction noise, construction waste, CWD, and coral post-translocation monitoring did not trigger the corresponding Action and Limit Levels in the reporting period.

The water quality monitoring results for dissolved oxygen (DO) and total alkalinity obtained during the reporting period did not trigger their corresponding Action and Limit Levels stipulated in the EM&A programme. Relevant investigation and follow-up actions will be conducted according to the EM&A programme if the corresponding Action and Limit Levels are triggered. For turbidity, suspended solids (SS), chromium, and nickel, some of the testing results triggered the relevant Action or Limit Levels in the reporting period and corresponding investigations were conducted accordingly. The investigation findings concluded that the cases were not related to the Project. To conclude, the construction activities in the reporting period did not introduce adverse impact to all water quality sensitive receivers.

The monthly terrestrial ecology monitoring on Sheung Sha Chau observed that there was no encroachment of any works upon the egret area nor any significant disturbance to ardeids at Sheung Sha Chau by the works.

The key findings of the EM&A programme during the reporting period is summarized as below:

| | Yes | No | Details | Analysis / Recommendation / Remedial Actions |
|--|-----|----|--|--|
| Breach of Limit Level [^] | | √ | No breach of Limit Level was recorded. | Nil |
| Breach of Action Level [^] | | √ | No breach of Action Level was recorded. | Nil |
| Complaints Received | √ | | A complaint regarding dust nuisance from sand barges in Tuen Mun was received on 6 Nov 2018. | ET found that there was one contractor deployed sand delivery vessels for the Project in recent months. Photo records provided by the contractor confirmed that dust mitigation measures were implemented during stopover/anchored at Tuen Mun Anchorage Area. ET will keep reminding contractors to continue the implementation of dust mitigation measures and conduct regular training for all frontline staff. |
| Notification of any summons and status of prosecutions | | √ | No notification of summons or prosecution were received. | Nil |
| Changes that affect the EM&A | √ | | Starting from 25 Oct 2018, water quality monitoring at SR1A was commenced. | Nil |

Remarks:

[^]Only triggering of Action or Limit Level found related to Project works is counted as Breach of Action or Limit Level.

1 Introduction

1.1 Background

On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the “Expansion of Hong Kong International Airport into a Three-Runway System” (the Project) was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual (the Manual) submitted under EP Condition 3.1¹. AECOM Asia Company Limited (AECOM) was employed by AAHK as the Independent Environmental Checker (IEC) for the Project.

The Project covers the expansion of the existing airport into a three-runway system (3RS) with key project components comprising land formation of about 650 ha and all associated facilities and infrastructure including taxiways, aprons, aircraft stands, a passenger concourse, an expanded Terminal 2, all related airside and landside works and associated ancillary and supporting facilities. The submarine aviation fuel pipelines and submarine power cables also require diversion as part of the works.

Construction of the Project is to proceed in the general order of diversion of the submarine aviation fuel pipelines, diversion of the submarine power cables, land formation, and construction of infrastructure, followed by construction of superstructures.

The updated overall phasing programme of all construction works was presented in Appendix A of the Construction Phase Monthly EM&A Report No. 7 and the contract information was presented in Appendix A of the Construction Phase Monthly EM&A Report No. 36.

1.2 Scope of this Report

This is the 12th Construction Phase Quarterly EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 October 2018 to 31 December 2018.

1.3 Project Organisation

The Project’s organisation structure is provided in **Appendix A**. Contact details of the key personnel have been updated and provided in and **Table 1.1**.

Table 1.1: Contact Information of Key Personnel

| Party | Position | Name | Telephone |
|---|--------------------------------|---------------|-----------|
| Project Manager’s Representative (Airport Authority Hong Kong) | Principal Manager, Environment | Lawrence Tsui | 2183 2734 |
| Environmental Team (ET) | Environmental Team Leader | Terence Kong | 2828 5919 |

¹ The Manual is available on the Project’s dedicated website (accessible at: <http://env.threerunwaysystem.com/en/index.html>)

| Party | Position | Name | Telephone |
|---|--|------------|-----------|
| (Mott MacDonald Hong Kong Limited) | Deputy Environmental Team Leader | Heidi Yu | 2828 5704 |
| | Deputy Environmental Team Leader | Daniel Sum | 2585 8495 |
| Independent Environmental Checker (IEC) (AECOM Asia Company Limited) | Independent Environmental Checker | Jackel Law | 3922 9376 |
| | Deputy Independent Environmental Checker | Roy Man | 3922 9348 |

Advanced Works:

| Party | Position | Name | Telephone |
|---|-----------------------|----------|-----------|
| Contract P560(R) Aviation Fuel Pipeline Diversion Works (Langfang Huayuan Mechanical and Electrical Engineering Co., Ltd.) | Project Manager | Wei Shih | 2117 0566 |
| | Environmental Officer | Lyn Liu | 5172 6543 |

Deep Cement Mixing (DCM) Works:

| Party | Position | Name | Telephone |
|--|-------------------------|------------------|-----------|
| Contract 3201 DCM (Package 1) (Penta-Ocean-China State-Dong-Ah Joint Venture) | Project Director | Tsugunari Suzuki | 9178 9689 |
| | Environmental Officer | Hiu Yeung Tang | 6329 3513 |
| Contract 3202 DCM (Package 2) (Samsung-BuildKing Joint Venture) | Project Manager | Ilkwon Nam | 9643 3117 |
| | Environmental Officer | David Man | 6421 3238 |
| Contract 3203 DCM (Package 3) (Sambo E&C Co., Ltd.) | Project Manager | Eric Kan | 9014 6758 |
| | Environmental Officer | David Hung | 9765 6151 |
| Contract 3204 DCM (Package 4) (CRBC-SAMBO Joint Venture) | Project Manager | Kyung-Sik Yoo | 9683 8697 |
| | Environmental Officer | Kanny Cho | 6799 8226 |
| Contract 3205 DCM (Package 5) (Bachy Soletanche - Sambo Joint Venture) | Deputy Project Director | Min Park | 9683 0765 |
| | Environmental Officer | Margaret Chung | 9130 3696 |

Reclamation Works:

| Party | Position | Name | Telephone |
|---|-----------------------|----------------|-----------|
| Contract 3206 Main Reclamation Works (ZHEC-CCCC-CDC Joint Venture) | Project Manager | Kim Chuan Lim | 3763 1509 |
| | Environmental Officer | Kwai Fung Wong | 3763 1452 |

Airfield Works:

| Party | Position | Name | Telephone |
|--|-----------------------|----------------|-----------|
| Contract 3301 North Runway Crossover Taxiway (FJT-CHEC-ZHEC Joint Venture) | Project Manager | Kin Hang Chung | 9412 1386 |
| | Environmental Officer | Nelson Tam | 9721 3942 |

Third Runway Concourse and Integrated Airport Centers Works:

| Party | Position | Name | Telephone |
|--|----------------------|-------------|-----------|
| Contract 3402 New Integrated Airport Centers Enabling Works (Wing Hing Construction Co., Ltd.) | Construction Manager | Michael Kan | 9206 0550 |

Terminal 2 Expansion Works:

| Party | Position | Name | Telephone |
|---|-----------------------|----------------|-----------|
| Contract 3501 Antenna Farm and Sewage Pumping Station (Build King Construction Ltd.) | Project Manager | Raymond Au | 6985 8860 |
| | Environmental Officer | Edward Tam | 9287 8270 |
| Contract 3502 Terminal 2 APM Depot Modification Works (Build King Construction Ltd.) | Project Manager | David Ng | 9010 7871 |
| | Environmental Officer | Chun Pong Chan | 9187 7118 |
| Contract 3503 Terminal 2 Foundation and Substructure Works (Leighton – Chun Wo Joint Venture) | Construction Manager | Eric Wu | 3973 1718 |
| | Environmental Officer | Stephen Tsang | 5508 6361 |
| Contract 3505 Terminal 2 Spectrum Lighting Mock- Ups (Union Contractors Ltd.) | Project Manager | Wylar Chan | 9107 5920 |
| | Environmental Officer | Kelvin Lam | 9379 2446 |

Automated People Mover (APM) Works:

| Party | Position | Name | Telephone |
|---|-----------------------|------------------|-----------|
| Contract 3602 Existing APM System Modification Works (Niigata Transys Co., Ltd.) | Project Manager | Kunihiro Tatecho | 9755 0351 |
| | Environmental Officer | Arthur Wong | 9170 3394 |

Baggage Handling System (BHS) Works:

| Party | Position | Name | Telephone |
|---|-----------------------|---------|-----------|
| Contract 3603 3RS Baggage Handling System (VISH Consortium) | Project Manager | Andy Ng | 9102 2739 |
| | Environmental Officer | Eric Ha | 9215 3432 |

Airport Support Infrastructure and Logistic Works:

| Party | Position | Name | Telephone |
|---|-----------------------|---------------|-----------|
| Contract 3801 APM and BHS Tunnels on Existing Airport Island (China State Construction Engineering (Hong Kong) Ltd.) | Project Manager | Tony Wong | 9642 8672 |
| | Environmental Officer | Fredrick Wong | 9842 2703 |

1.4 Contact information for the Project

The contact information for the Project is provided in **Table 1.2**. The public can contact us through the following channels if they have any queries and comments on the environmental monitoring data and project related information.

Table 1.2: Contact Information of the Project

| Channels | Contact Information |
|-----------------------|--|
| Hotline | 3908 0354 |
| Email | env@3rsproject.com |
| Fax | 3747 6050 |
| Postal Address | Airport Authority Hong Kong HKIA Tower 1 Sky Plaza Road Hong Kong International Airport Lantau Hong Kong Attn: Environmental Team Leader Mr Terence Kong c/o Mr Lawrence Tsui (TRD) |

1.5 Summary of Construction Works

The key activities of the Project carried out in the reporting period included reclamation works and land-side works. Reclamation works included deep cement mixing (DCM) works, marine filling, seawall construction, laying of sand blanket, and prefabricated vertical drain (PVD) installation. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for Automated People Mover (APM) and Baggage Handling System (BHS), and preparation work for utilities, with activities include site establishment, site office construction, road and drainage works, cable ducting, demolition of existing facilities, piling, and excavation works.

The locations of the works areas are presented in **Figure 1.1** to **Figure 1.2**.

1.6 Summary of EM&A Programme Requirements

The status for all environmental aspects is presented in **Table 1.3**. The EM&A requirements remained unchanged during the reporting period.

Table 1.3: Summary of Status for All Environmental Aspects under the Updated EM&A Manual

| Parameters | EM&A Requirements | Status |
|--|---|---|
| Air Quality | | |
| Baseline Monitoring | At least 14 consecutive days before commencement of construction work | The baseline air quality monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4. |
| Impact Monitoring | At least 3 times every 6 days | On-going |
| Noise | | |
| Baseline Monitoring | Daily for a period of at least two weeks prior to the commencement of construction works | The baseline noise monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4. |
| Impact Monitoring | Weekly | On-going |
| Water Quality | | |
| General Baseline Water Quality Monitoring for reclamation, water jetting and field joint works | Three days per week, at mid-flood and mid-ebb tides, for at least four weeks prior to the commencement of marine works. | The baseline water quality monitoring result has been reported in Baseline Water Quality Monitoring Report and submitted to EPD under EP Condition 3.4. |
| General Impact Water Quality Monitoring for reclamation, water jetting and field joint works | Three days per week, at mid-flood and mid-ebb tides. | On-going |
| Initial Intensive Deep Cement Mixing (DCM) Water Quality Monitoring | At least four weeks | The Initial Intensive DCM Monitoring Report was submitted and approved by EPD in accordance with the Detailed Plan on DCM. |
| Regular DCM Water Quality Monitoring | Three times per week until completion of DCM works. | On-going |
| Waste Management | | |
| Waste Monitoring | At least weekly | On-going |
| Land Contamination | | |
| Supplementary Contamination Assessment Plan (CAP) | At least 3 months before commencement of any soil remediation works. | The Supplementary CAP was submitted and approved by EPD pursuant to EP condition 2.20. |
| Contamination Assessment Report (CAR) for Golf Course | CAR to be submitted for golf course first; programme for submission of supplementary CAR at the other areas to be agreed. | The CAR for Golf Course was submitted to EPD. |
| Terrestrial Ecology | | |
| Pre-construction Egret Survey Plan | Once per month in the breeding season between April and July, prior to the commencement of HDD drilling works. | The Egret Survey Plan was submitted and approved by EPD under EP Condition 2.14. |

| Parameters | EM&A Requirements | Status |
|--|---|--|
| Ecological Monitoring | Monthly monitoring during the HDD construction works period from August to March. | On-going |
| Marine Ecology | | |
| Pre-Construction Phase Coral Dive Survey | Prior to marine construction works | The Coral Translocation Plan was submitted and approved by EPD under EP Condition 2.12. |
| Coral Translocation | - | The coral translocation was completed on 5 January 2017. |
| Post-translocation Monitoring | As per an enhanced monitoring programme based on the Coral Translocation Plan | The post-translocation monitoring programme according to the Coral Translocation Plan was completed in April 2018. |
| Chinese White Dolphins (CWD) | | |
| Baseline Monitoring | 6 months of baseline surveys before the commencement of land formation related construction works. Vessel line transect surveys: Two full surveys per month; Land-based theodolite tracking surveys: Two days per month at the Sha Chau station and two days per month at the Lung Kwu Chau station; and Passive Acoustic Monitoring (PAM): For the whole duration of baseline period. | Baseline CWD results were reported in the CWD Baseline Monitoring Report and submitted to EPD in accordance with EP Condition 3.4. |
| Impact Monitoring | Vessel line transect surveys: Two full surveys per month; Land-based theodolite tracking surveys: One day per month at the Sha Chau station and one day per month at the Lung Kwu Chau station; and PAM: For the whole duration for land formation related construction works. | On-going |
| Landscape and Visual | | |
| Landscape and Visual Plan | At least 3 months before the commencement of construction works on the formed land of the Project. | The Landscape & Visual Plan was submitted to EPD under EP Condition 2.18 |
| Baseline Monitoring | One-off survey within the Project site boundary prior to commencement of any construction works | The baseline landscape & visual monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4. |
| Impact Monitoring | Weekly | On-going |
| Environmental Auditing | | |
| Regular site inspection | Weekly | On-going |
| Marine Mammal Watching Plan (MMWP) implementation measures | Monitor and check | On-going |
| Dolphin Exclusion Zone (DEZ) Plan implementation measures | Monitor and check | On-going |

| Parameters | EM&A Requirements | Status |
|---|--------------------|----------|
| SkyPier High Speed Ferries (HSF) implementation measures | Monitor and check | On-going |
| Construction and Associated Vessels implementation measures | Monitor and check | On-going |
| Complaint Hotline and Email Channel | Construction phase | On-going |
| Environmental Log Book | Construction phase | On-going |

Taking into account the construction works in the reporting period, impact monitoring of air quality, noise, water quality, waste management, terrestrial ecology, landscape & visual, and CWD were carried out in the reporting period. Upon completion of coral translocation in January 2017, a summary of the ensuing post-translocation monitoring is reported quarterly.

The EM&A programme also involved weekly site inspections and related auditing conducted by ET for the checking of implementation of required environmental mitigation measures recommended in the approved EIA Report. To promote the environmental awareness and enhance the environmental performance of the contractors, environmental trainings and regular environmental management meetings were conducted during the reporting period which are summarized as below:

- Three dolphin observer trainings provided by ET;
- Five skipper trainings provided by ET;
- Two meetings with High Speed Ferry operators for experience sharing and recommendations to strengthen the implementation of the Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier;
- Twenty-one environmental management meetings for EM&A review with works contracts;
- One EPD sharing on key issues of waste management and construction dust control.

The EM&A programme has been following the recommendations presented in the approved EIA Report and the Manual. A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix B**.

2 Environmental Monitoring and Auditing

2.1 Air Quality Monitoring

Impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted three times every six days at two representative monitoring stations during the reporting period. The locations of monitoring stations are described in **Table 2.1** and presented in **Figure 2.1**.

2.1.1 Action and Limit Levels

The Action and Limit Levels of the air quality monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are provided in **Table 2.1** for reference.

Table 2.1: Impact Air Quality Monitoring Stations

| Monitoring Station | Location | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|--------------------|--------------------------|---|--|
| AR1A | Man Tung Road Park | 306 | 500 |
| AR2 | Village House at Tin Sum | 298 | |

2.1.2 Summary of Monitoring Results

The air quality monitoring results in the reporting period are summarized in **Table 2.2** and the graphical plot is presented in **Appendix C**.

Table 2.2: Percentage of Air Quality Monitoring Results within Action and Limit Levels

| | AR1A | AR2 |
|----------|--------|--------|
| Oct 2018 | 100.0% | 100.0% |
| Nov 2018 | 100.0% | 100.0% |
| Dec 2018 | 100.0% | 100.0% |
| Overall | 100.0% | 100.0% |

Note: The percentages are calculated by dividing the number of monitoring results within their corresponding Action and Limit Levels by the total number of monitoring results.

All monitoring results were within their corresponding Action and Limit Levels at all monitoring stations in the reporting period.

General meteorological conditions from the last month of previous quarter to this reporting period were recorded and summarized in **Table 2.3**.

Table 2.3: General Meteorological Condition During Impact Air Quality Monitoring

| | Weather | Dominant Wind Direction |
|----------|-----------------|-------------------------|
| Sep 2018 | Sunny to Rainy | South or Southwest |
| Oct 2018 | Sunny to Rainy | North or East |
| Nov 2018 | Sunny to Rainy | East |
| Dec 2018 | Sunny to Cloudy | North or Northwest |

2.1.3 Conclusion

No dust emission source from Project activities was observed during impact air quality monitoring. Major sources of dust observed at the monitoring stations during the monitoring sessions were local air pollution and nearby traffic emissions. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the Project activities.

2.2 Noise Monitoring

Impact noise monitoring was conducted at four representative monitoring stations once per week during 0700 and 1900 in the reporting period. The locations of monitoring stations are described in **Table 2.4** and presented in **Figure 2.1**.

2.2.1 Action and Limit Levels

The Action and Limit Levels of the noise monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are provided in **Table 2.4** for reference.

Table 2.4: Impact Noise Monitoring Stations

| Monitoring Station | Location | Action Level | Limit Level |
|--------------------|--|---|-----------------------------------|
| NM1A | Man Tung Road Park | When one documented complaint is received from any one of the sensitive receivers | 75 dB(A) |
| NM4 | Ching Chung Hau Po Woon Primary School | | 65dB(A) / 70 dB(A) ⁽ⁱ⁾ |
| NM5 | Village House in Tin Sum | | 75 dB(A) |
| NM6 | House No. 1, Sha Lo Wan | | 75 dB(A) |

Note:

⁽ⁱ⁾ Reduced to 70dB(A) for school and 65dB(A) during school examination periods at NM4. School examination took place from 9 to 15 November in this reporting period.

2.2.2 Summary of Monitoring Results

The noise monitoring results in the reporting period are summarized in **Table 2.5** and the graphical plot is presented in **Appendix C**.

Table 2.5: Percentage of Noise Monitoring Results within Action and Limit Levels

| | NM1A | NM4 | NM5 | NM6 |
|----------|--------|--------|--------|--------|
| Oct 2018 | 100.0% | 100.0% | 100.0% | 100.0% |
| Nov 2018 | 100.0% | 100.0% | 100.0% | 100.0% |
| Dec 2018 | 100.0% | 100.0% | 100.0% | 100.0% |
| Overall | 100.0% | 100.0% | 100.0% | 100.0% |

No complaints were received from any sensitive receiver that triggered the Action Level. All monitoring results were also within the corresponding Limit Levels at all monitoring stations in the reporting period.

2.2.3 Conclusion

As the construction activities were far away from the monitoring stations, major sources of noise dominating the monitoring stations observed during the monitoring sessions were road traffic and aircraft noise near NM1A, school activities at NM4, and aircraft and helicopter noise near NM5

and NM6. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the Project activities.

2.3 Water Quality Monitoring

During the reporting period, water quality monitoring was conducted three days per week, at mid-flood and mid-ebb tides, at a total of 23 water quality monitoring stations, comprising 12 impact (IM) stations, 8 sensitive receiver (SR) stations, and 3 control (C) stations in the vicinity of the water quality sensitive receivers around the airport island in accordance with the Manual. The purpose of water quality monitoring at the IM stations is to promptly capture any potential water quality impacts from the Project before the impacts could become apparent at sensitive receivers (represented by the SR stations). **Table 2.6** describes the details of the monitoring stations. **Figure 2.2** shows the locations of the monitoring stations.

Table 2.6: Monitoring Locations and Parameters for Impact Water Quality Monitoring

| Monitoring Station | Description | Coordinates | | Parameters |
|---------------------|--|-------------|----------|--|
| | | Easting | Northing | |
| C1 | Control Station | 804247 | 815620 | <u>General Parameters</u> |
| C2 | Control Station | 806945 | 825682 | DO, pH, |
| C3 ⁽³⁾ | Control Station | 817803 | 822109 | Temperature, |
| IM1 | Impact Station | 807132 | 817949 | Salinity, Turbidity, |
| IM2 | Impact Station | 806166 | 818163 | SS |
| IM3 | Impact Station | 805594 | 818784 | <u>DCM Parameters</u> |
| IM4 | Impact Station | 804607 | 819725 | Total Alkalinity, |
| IM5 | Impact Station | 804867 | 820735 | Heavy Metals ⁽²⁾ |
| IM6 | Impact Station | 805828 | 821060 | |
| IM7 | Impact Station | 806835 | 821349 | |
| IM8 | Impact Station | 808140 | 821830 | |
| IM9 | Impact Station | 808811 | 822094 | |
| IM10 | Impact Station | 809794 | 822385 | |
| IM11 | Impact Station | 811460 | 822057 | |
| IM12 | Impact Station | 812046 | 821459 | |
| SR1A ⁽¹⁾ | Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) Seawater Intake for cooling | 812586 | 820069 | <u>General Parameters</u> DO, pH, Temperature, Salinity, Turbidity, SS |
| SR2 ⁽³⁾ | Planned marine park / hard corals at The Brothers / Tai Mo To | 814166 | 821463 | <u>General Parameters</u> DO, pH, Temperature, Salinity, Turbidity, SS <u>DCM Parameters</u> Total Alkalinity, Heavy Metals ⁽²⁾⁽⁴⁾ |
| SR3 | Sha Chau and Lung Kwu Chau Marine Park / fishing and spawning | 807571 | 822147 | <u>General Parameters</u> |

| Monitoring Station | Description | Coordinates | | Parameters |
|--------------------|---|-------------|--------|--|
| | grounds in North Lantau | | | DO, pH, Temperature, Salinity, Turbidity, SS |
| SR4A | Sha Lo Wan | 807810 | 817189 | |
| SR5A | San Tau Beach SSSI | 810696 | 816593 | |
| SR6 | Tai Ho Bay, Near Tai Ho Stream SSSI | 814663 | 817899 | |
| SR7 | Ma Wan Fish Culture Zone (FCZ) | 823742 | 823636 | |
| SR8 ⁽⁵⁾ | Seawater Intake for cooling at Hong Kong International Airport (East) | 811418 | 820246 | |

Notes:

- (1) With the operation of HKBCF, water quality monitoring at SR1A station was commenced on 25 October 2018.
- (2) Details of selection criteria for the two heavy metals for regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website (<http://env.threerunwaysystem.com/en/ep-submissions.html>). DCM specific water quality monitoring parameters (total alkalinity and heavy metals) were only conducted at C1 to C3, SR2, and IM1 to IM12.
- (3) According to the Baseline Water Quality Monitoring Report, C3 station is not adequately representative as a control station of impact/ SR stations during the flood tide. The control reference has been changed from C3 to SR2 from 1 September 2016 onwards.
- (4) Total alkalinity and heavy metals results are collected at SR2 as a control station for regular DCM monitoring.
- (5) The monitoring location for SR8 is subject to further changes due to silt curtain arrangements and the progressive relocation of this seawater intake.

2.3.1 Action and Limit Levels

The Action and Limit Levels for general water quality monitoring and regular DCM monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are presented in **Table 2.7**. The control and IM stations during flood tide and ebb tide for general water quality monitoring and regular DCM monitoring are presented in **Table 2.8**.

Table 2.7: Action and Limit Levels for General Water Quality Monitoring and Regular DCM Monitoring

| Parameters | Action Level | | Limit Level | |
|--|--------------------------------|---|---|---|
| Action and Limit Levels for general water quality monitoring and regular DCM monitoring (excluding SR1A & SR8) | | | | |
| DO in mg/L (Surface, Middle & Bottom) | Surface and Middle 4.5 mg/L | | Surface and Middle 4.1 mg/L 5 mg/L for Fish Culture Zone (SR7) only | |
| | Bottom 3.4 mg/L | | Bottom 2.7 mg/L | |
| SS in mg/L | 23 | or 120% of upstream control station at the same tide of the same day, whichever is higher | 37 | or 130% of upstream control station at the same tide of the same day, whichever is higher |
| Turbidity in NTU | 22.6 | | 36.1 | |
| Total Alkalinity in ppm | 95 | | 99 | |
| Representative Heavy Metals for regular DCM monitoring (Chromium) | 0.2 | | 0.2 | |
| Representative Heavy Metals for regular DCM monitoring (Nickel) | 3.2 | | 3.6 | |

| Parameters | Action Level | Limit Level |
|-------------------------------------|--------------|-------------|
| Action and Limit Levels SR1A | | |
| SS (mg/l) | 33 | 42 |
| Action and Limit Levels SR8 | | |
| SS (mg/l) | 52 | 60 |

Notes:

1. For DO measurement, Action or Limit Level is triggered when monitoring result is lower than the limits.
2. For parameters other than DO, Action or Limit Level of water quality results is triggered when monitoring results is higher than the limits.
3. Depth-averaged results are used unless specified otherwise.
4. Details of selection criteria for the two heavy metals for regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website <http://env.threerunwaysystem.com/en/ep-submissions.html>
5. The Action and Limit Levels for the two representative heavy metals chosen will be the same as that for the intensive DCM monitoring.

Table 2.8: The Control and Impact Stations during Flood Tide and Ebb Tide for General Water Quality Monitoring and Regular DCM Monitoring

| Control Station | Impact Stations |
|-------------------|---|
| Flood Tide | |
| C1 | IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, SR3 |
| SR2 ¹ | IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR3, SR4A, SR5A, SR6, SR8 |
| Ebb Tide | |
| C1 | SR4A, SR5A, SR6 |
| C2 | IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR2, SR3, SR7, SR8 |

Note:

1. As per findings of Baseline Water Quality Monitoring Report, the control reference has been changed from C3 to SR2 from 1 Sep 2016 onwards.

2.3.2 Summary of Monitoring Results

The summary of results within their corresponding Action and Limit Levels in the reporting period are presented in **Table 2.9**. The weather and sea conditions from September to December 2018 were recorded and summarized in **Table 2.10**. It should be noted that Super Typhoon Yutu affected Hong Kong from 1 to 2 November 2018 and water quality monitoring results might be affected by this weather event.

Table 2.9: Percentage of Water Quality Monitoring Results within Action and Limit Levels

| | <u>General Water Quality Monitoring</u> | | | | <u>Regular DCM Monitoring</u> | | |
|----------|---|----------------|-------|-----------|-------------------------------|----------|--------|
| | DO (Surface and Middle) | DO (Bottom) | SS | Turbidity | Alkalinity | Chromium | Nickel |
| Oct 2018 | 100.0% | 100.0% | 99.1% | 100.0% | 100.0% | 100.0% | 98.3% |
| Nov 2018 | 100.0% | 100.0% | 98.4% | 98.6% | 100.0% | 100.0% | 98.0% |
| Dec 2018 | 100.0% | 100.0% | 99.8% | 100.0% | 100.0% | 99.0% | 99.4% |
| Overall | 100.0% | 100.0% | 99.1% | 99.5% | 100.0% | 99.7% | 98.6% |

Note: The percentages are calculated by dividing the number of depth-averaged results complying with their corresponding Action and Limit Levels by the total number of depth-averaged results.

Table 2.10: General Weather Condition and Sea Condition During Impact Water Quality Monitoring

| | Weather | Sea Condition |
|----------|-----------------|---------------|
| Sep 2018 | Sunny to Rainy | Calm to Rough |
| Oct 2018 | Sunny to Rainy | Calm to Rough |
| Nov 2018 | Sunny to Rainy | Calm to Rough |
| Dec 2018 | Sunny to Cloudy | Calm to Rough |

The monitoring results for DO and total alkalinity obtained in the reporting period were within their corresponding Action and Limit Levels stipulated in the EM&A programme. Relevant investigation and follow-up actions will be conducted according to the EM&A programme if the corresponding Action and Limit Levels are triggered. For turbidity, SS, chromium, and nickel, some of the testing results triggered the relevant Action or Limit Level in the reporting period, and investigations were conducted accordingly.

Summaries of results triggering Action or Limit Level for turbidity, SS, chromium, and nickel are presented in **Table 2.11** to **Table 2.16**.

Details of the investigation findings were presented in Construction Phase Monthly EM&A Report No. 34, 35 and 36, which concluded that all results triggering the Action or Limit Level were not related to the Project.

Table 2.11: Summary of Turbidity Results Triggering Action or Limit Level (Mid-Flood Tide)

| | IM1 | IM2 | IM3 | IM4 | IM5 | IM6 | IM7 | IM8 | IM9 | IM10 | IM11 | IM12 | SR3 | SR4A | SR5A | SR6 | SR7 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|-----|------|------|-----|-----|
| 27/11/2018 | | | | | D | D | | | | | | | | | | | |
| No. of result triggering Action or Limit Level | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

Table 2.12: Summary of SS Results Triggering Action or Limit Level (Mid-Ebb Tide)

| | IM1 | IM2 | IM3 | IM4 | IM5 | IM6 | IM7 | IM8 | IM9 | IM10 | IM11 | IM12 | SR1A | SR2 | SR3 | SR4A | SR5A | SR6 | SR7 | SR8 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|-----|-----|------|------|-----|-----|-----|
| 01/12/2018 | | | D | | | | | | | | | | | | | | | | | |
| No. of result triggering Action or Limit Level | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 2.13: Summary of SS Results Triggering Action or Limit Level (Mid-Flood Tide)

| | IM1 | IM2 | IM3 | IM4 | IM5 | IM6 | IM7 | IM8 | IM9 | IM10 | IM11 | IM12 | SR1A | SR3 | SR4A | SR5A | SR6 | SR7 | SR8 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|-----|------|------|-----|-----|-----|
| 09/10/2018 | | | | | D | D | | | | | | | | | | | | | |
| 11/10/2018 | | | | | D | | | | | | | | | | | | | | |
| 13/10/2018 | | | | | | | | | | | | | | | | | | | |
| 08/11/2018 | | | | | | | | | | | | | | D | | | | | |
| 10/11/2018 | | | | | D | | | | | D | | | | | | | | | |
| 27/11/2018 | | | | | D | | | | | | | | | | | | | | |
| 29/11/2018 | | | | | | | | | D | | | | | | | | | | |
| No. of result triggering Action or Limit Level | 0 | 0 | 0 | 1 | 4 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

Table 2.14: Summary of Chromium Results Triggering Action or Limit Level (Mid-Ebb Tide)

| | IM1 | IM2 | IM3 | IM4 | IM5 | IM6 | IM7 | IM8 | IM9 | IM10 | IM11 | IM12 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| 22/12/2018 | | | | | | | | | | | D | D |
| 27/12/2018 | | | | | | | | | | | | |
| No. of result triggering Action or Limit Level | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |

Table 2.15: Summary of Nickel Results Triggering Action or Limit Level (Mid-Ebb Tide)

| | IM1 | IM2 | IM3 | IM4 | IM5 | IM6 | IM7 | IM8 | IM9 | IM10 | IM11 | IM12 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| 25/10/2018 | | | | | | | | | | | D | D |
| 17/11/2018 | D | D | | D | | | | | | | | |
| No. of result triggering Action or Limit Level | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 1 |

Table 2.16: Summary of Nickel Results Triggering Action or Limit Level (Mid-Flood Tide)

| | IM1 | IM2 | IM3 | IM4 | IM5 | IM6 | IM7 | IM8 | IM9 | IM10 | IM11 | IM12 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| 4/12/2018 | | | | | | | D | D | | | | |
| No. of result triggering Action or Limit Level | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |

Note: The monitoring results on monitoring dates not presented in the above tables did not trigger their corresponding Action or Limit Levels. Detailed results are presented in **Appendix C**.

| Legend: | |
|---------|--|
| | Result within corresponding Action and Limit Levels |
| | Result triggered the Action Level at monitoring station located upstream of the Project based on dominant tidal flow |
| D | Result triggered the Action Level at monitoring station located downstream of the Project based on dominant tidal flow |
| D | Result triggered the Limit Level at monitoring station located downstream of the Project based on dominant tidal flow |
| | No water quality monitoring conducted at SR1A before the operation of HKBCF. |
| | Upstream station with respect to the Project during the respective tide based on dominant tidal flow |
| | Downstream station with respect to the Project during the respective tide based on dominant tidal flow |

2.3.3 Conclusion

In the reporting period, it is noted that most monitoring results were within their corresponding Action and Limit Levels, while minor number of results triggered their corresponding Action or Limit Level, and investigations were conducted accordingly. Based on the findings presented in Construction Phase Monthly EM&A Report No. 34, 35 and 36, all cases that triggered the corresponding Action or Limit Level were not related to the Project; hence, the Project did not introduce adverse impact to all water quality sensitive receivers. All required actions under the Event and Action Plan were followed.

Nevertheless, the non-project related triggers were attended to and initiated corresponding action and measures. As part of the EM&A programme, the construction methods and mitigation measures for water quality will continue to be monitored and opportunities for further

enhancement will continue to be explored and implemented where possible, to strive for better protection of water quality and the marine environment.

In the meantime, the contractors were reminded to implement and maintain all mitigation measures during weekly site inspections. These include maintaining the silt curtain for sand blanket laying properly and maintaining the levels of materials on barges to avoid overflow as recommended in the Manual.

2.4 Waste Monitoring

In accordance with the Manual, waste generated from construction activities was audited once per week to determine if wastes were being managed in accordance with the Waste Management Plan (WMP) prepared for the Project, contract-specific WMP, and any statutory and contractual requirements. All aspects of waste management including waste generation, storage, transportation, and disposal were assessed during the audits.

2.4.1 Action and Limit Levels

The Action and Limit Levels of the construction waste are provided in **Table 2.17**.

Table 2.17: Action and Limit Levels for Construction Waste

| Monitoring Stations | Action Level | Limit Level |
|---------------------|---|---|
| Construction Area | When one valid documented complaint is received | Non-compliance of the WMP, contract-specific WMPs, any statutory and contractual requirements |

2.4.2 Summary of Monitoring Results

Weekly monitoring of the Project construction works was carried out by the ET in the reporting period to check and monitor the implementation of proper waste management practices during the construction phase.

Recommendations made included provision and maintenance of proper chemical waste storage area, as well as handling, segregation, and regular disposal of general refuse. The contractors had taken actions to implement the recommended measures.

Based on updated contractors' information, summary of construction waste generated in the reporting period is presented in **Table 2.18**.

There were no complaints, non-compliance of the WMP, contract-specific WMPs, statutory and contractual requirements that triggered Action and Limit Levels in the reporting period.

Table 2.18: Construction Waste Statistics

| | C&D ¹ Material Stockpiled for Reuse or Recycle (m ³) | C&D Material Reused in the Project (m ³) | C&D Material Reused in other Projects (m ³) | C&D Material Transferred to Public Fill (m ³) | Chemical Waste (kg) | Chemical Waste (L) | General Refuse (tonne) ² |
|-----------------------|--|--|--|--|---------------------------|--------------------------|---|
| Oct 2018 ³ | 4,146 | 5,400 | - | 5,746 | 11,485 | 27,280 | 445 |
| Nov 2018 ³ | 3,107 | 3,719 | 1,238 | 9,440 | 180 | 9,440 | 519 |
| Dec 2018 ³ | 5,965 | 3,849 | - | 4,362 | 2,700 | 12,000 | 354 |
| Total | 13,218 | 12,968 | 1,238 | 19,548 | 14,365 | 48,720 | 1,318 |

Notes:

| C&D ¹ Material Stockpiled for Reuse or Recycle (m ³) | C&D Material Reused in the Project (m ³) | C&D Material Reused in other Projects (m ³) | C&D Material Transferred to Public Fill (m ³) | Chemical Waste (kg) | Chemical Waste (L) | General Refuse (tonne) ² |
|--|--|--|--|---------------------------|--------------------------|---|
| <ol style="list-style-type: none"> 1. C&D refers to Construction and Demolition. 2. Figures are rounded off to the nearest tonne. 3. Paper, metals and/or plastics were recycled in the reporting period. | | | | | | |

2.5 Chinese White Dolphin Monitoring

CWD monitoring was conducted by vessel line transect survey at a frequency of two full surveys per month, supplemented by land-based theodolite tracking survey and PAM. The frequency of the land-based theodolite tracking survey during the construction phase was one day per month at both Sha Chau (SC) and Lung Kwu Chau (LKC) stations as stipulated in the Manual. Additional theodolite tracking surveys for one day at SC station and two days at LKC station were conducted on a voluntary basis to collect supplementary information for the Project, such that a total of two tracking days at SC station and three tracking days at LKC station were conducted per month. The vessel survey transects followed the transect lines proposed in the Manual and are consistent with those used in the Agriculture, Fisheries and Conservation Department (AFCD) long-term CWD monitoring programme. The transect locations of CWD monitoring by vessel line transect survey conducted from October to December 2018 are shown in **Figure 2.3**, whilst the land-based theodolite tracking survey stations are described in **Table 2.19** and depicted in **Figure 2.4**. The location of the PAM device is shown in **Figure 2.10**.

Table 2.19: Land-based Theodolite Tracking Survey Station Details

| Stations | Location | Geographical Coordinates | Station Height (m) | Approximate Tracking Distance (km) |
|----------|---------------------|--------------------------------------|--------------------|------------------------------------|
| D | Sha Chau (SC) | 22° 20' 43.5" N 113° 53' 24.66" E | 45.66 | 2 |
| E | Lung Kwu Chau (LKC) | 22° 22' 44.83" N 113° 53' 0.2" E | 70.40 | 3 |

2.5.1 Action and Limit Levels

The Action Level and Limit Level for CWD monitoring were formulated by an action response approach using the running quarterly dolphin encounter rates (STG and ANI) derived from baseline monitoring data, as presented in the CWD Baseline Monitoring Report. The derived values of Action and Limit Levels for CWD monitoring are shown in **Table 2.20**.

Table 2.20: Derived Values of Action Level and Limit Level for Chinese White Dolphin Monitoring

| NEL, NWL, AW, WL and SWL as a Whole | |
|-------------------------------------|---|
| Action Level | Running quarterly STG < 1.86 & ANI < 9.35 |
| Limit Level | Two consecutive running quarterly (3-month) STG < 1.86 & ANI < 9.35 |

2.5.2 Summary of Monitoring Results

2.5.2.1 Vessel Line Transect Survey

Survey Effort

During the October to December 2018 reporting period, a total of six sets of vessel line transect survey covering all transects in Northeast Lantau (NEL), Northwest Lantau (NWL), Airport West (AW), West Lantau (WL) and Southwest Lantau (SWL) survey areas were conducted at a frequency of twice per month, in each survey area.

A total of around 1,345 km of survey effort was collected from these surveys, with around 91.8% of the total survey effort being conducted under favourable weather condition (i.e. Beaufort Sea State 3 or below with favourable visibility). Details of the survey effort data are presented in **Appendix C**.

CWD Sighting

From October to December 2018, there were a total of 42 sightings of CWDs, with 140 dolphins sighted (**Table 2.21**). Amongst the sightings of CWDs, 39 sightings with 128 dolphins were made during on-effort searches under favourable weather conditions.

When breaking down the sightings by survey areas, 12 sightings with 35 dolphins, 24 sightings with 89 dolphins and 5 sightings with 15 dolphins were recorded in NWL, WL and SWL survey areas respectively during the current reporting period. In addition, one CWD sighting consisting of a single individual was recorded in NEL survey area in October 2018, which was the second CWD sighting of NEL survey area for the CWD monitoring of 3RS Project after the first sighting made in August 2018. No CWD was sighted on AW transects.

Compared with the last quarter (i.e. July to September 2018), there is an overall observable decline in terms of both number of CWD sightings and number of dolphins (decreased by around 34% and 30% respectively). Both WL and SWL showed observable decline in terms of both number of CWD sightings and number of dolphins (WL: decreased by around 40% and 35% respectively; SWL: decreased by around 58% and 56% respectively). On the contrary, the number of CWD sighting in NWL remained similar to the last quarter and there was even an increase in terms of number of dolphins (i.e. increased by around 21%). The decrease in the number of CWD sightings and number of dolphins in the fourth quarter is primarily due to seasonal variation, making reference to previous AFCD marine mammals monitoring records, the third quarter has normally been the peak season for CWDs in Hong Kong (Figure 4.2 of the 3RS CWD Baseline Monitoring Report refers).

Compared with the same quarter of last year in 2017 (i.e. October to December 2017), there is an overall slight decrease of CWD records, in terms of both the number of sightings (about 11%) and the number of dolphins (about 17%). The decrease is most pronounced in NWL in terms of the number of dolphins (about a 44% decrease).

Table 2.21 below shows the comparison of the numbers of sightings and dolphins amongst the current reporting period, last quarter, and the same quarter of year 2017.

Table 2.21: Summary of Number of CWD Sightings and Number of Dolphins for the Same Quarter Last Year, Previous Quarter, and Current Reporting Period

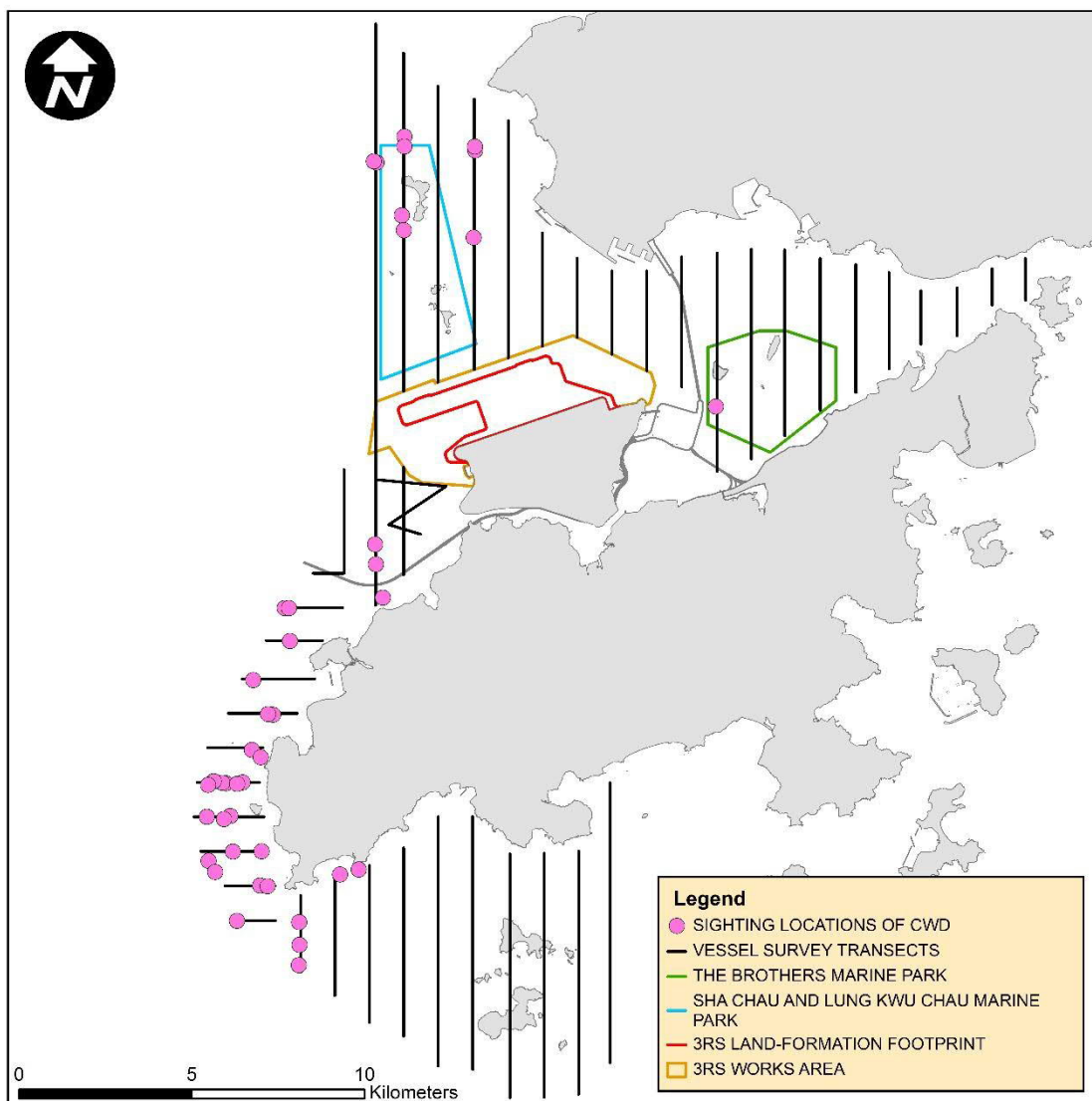
| | Same Quarter of Last Year October to December 2017 | Previous Reporting Period July to September 2018 | Current Reporting Period October to December 2018 |
|-----|---|---|--|
| NEL | 0 (0) | 1 (1) | 1 (1) |

| | Same Quarter of Last Year | Previous Reporting Period | Current Reporting Period |
|-------|---------------------------|---------------------------|--------------------------|
| NWL | 13 (62) | 11 (29) | 12 (35) |
| AW | 2 (10) | 0 (0) | 0 (0) |
| WL | 24 (78) | 40 (137) | 24 (89) |
| SWL | 8 (18) | 12 (34) | 5 (15) |
| Total | 47 (168) | 64 (201) | 42 (140) |

Note: Values in () represent number of dolphins

The distribution of CWD sightings recorded from October to December 2018 is illustrated in **Figure 2.5**. In NEL, the single sighting was recorded on the second transect from the western side of the transect area within the Brothers Marine Park. In NWL, the majority of the sightings were located within and around SCLKCMP, particularly the northern part; a few CWD sightings were recorded in the southwestern corner of the survey area, while no CWD was sighted in close vicinity to the 3RS works area. In WL, CWD sightings were distributed across the entire survey area with more sightings recorded in the waters from Peaked Hill to Fan Lau. In SWL, CWD sightings were all towards the western side of the transect area. Details of the sighting data are presented in **Appendix C**.

Figure 2.5: Sightings Distribution of Chinese White Dolphins from October to December 2018



Remarks: Please note that there are 42 pink circles on the map indicating the sighting locations of CWD. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

Encounter Rate

The dolphin encounter rates for the number of on-effort dolphin sightings per 100 km survey effort (STG) and for the total on-effort number of dolphins per 100 km survey effort (ANI) in the whole survey area (i.e. NEL, NWL, AW, WL and SWL) for October, November and December 2018 are summarized in **Table 2.22**.

In this reporting period, both the monthly STG and ANI increased from October to November but then decreased substantially in December. The running quarterly STG and ANI encounter rates declined, although the Action Level (running quarterly STG < 1.86 & ANI < 9.35) was not triggered.

Compared with the previous reporting period, the running quarterly STG decreased from 4.82 to 3.16 and the ANI from 15.32 to 10.36, which is likely due to seasonal variation that, making reference to previous AFCD marine mammals monitoring records, where the third quarter has

normally been the peak season for encountering CWDs as mentioned in the previous section. While comparing with the same quarter of last year (i.e. October to December 2017), both running quarterly STG and ANI in each month were lower than the same period in 2017, from 4.05 to 3.16 and 14.75 to 10.36 respectively. As there is no significant change in deployment of works vessels and barges in this quarter comparing with the previous reporting quarter and the same quarter of last year (although there were notably reduced ground improvement works barges operating in the period), there is no obvious relationship between 3RS marine works activities and the decrease of running quarterly encounter rates in this reporting period. It is also worth noting there was a rise in monthly STG and ANI levels recorded in November 2018 that contrasts significantly with the drop in both as recorded in November 2017.

Table 2.22: Summary of Monthly and Running Quarterly STG and ANI of Chinese White Dolphin for the Same Quarter Last Year, Previous Quarter, and Current Reporting Period

| | Same Quarter of Last Year | | | Previous Reporting Period | | | Current Reporting Period | | |
|-----------------------|---------------------------|--------|--------|---------------------------|--------|--------|--------------------------|--------|--------|
| | Oct 17 | Nov 17 | Dec 17 | Jul 18 | Aug 18 | Sep 18 | Oct 18 | Nov 18 | Dec 18 |
| Monthly STG | 4.54 | 2.07 | 5.33 | 5.04 | 4.48 | 4.97 | 3.07 | 4.85 | 1.67 |
| Monthly ANI | 16.02 | 6.82 | 20.77 | 13.86 | 15.67 | 16.26 | 8.97 | 14.28 | 8.10 |
| Running Quarterly STG | 5.90 | 4.09 | 4.05 | 3.74 | 4.66 | 4.82 | 4.19 | 4.29 | 3.16 |
| Running Quarterly ANI | 19.05 | 13.91 | 14.75 | 11.57 | 15.58 | 15.32 | 13.71 | 13.19 | 10.36 |

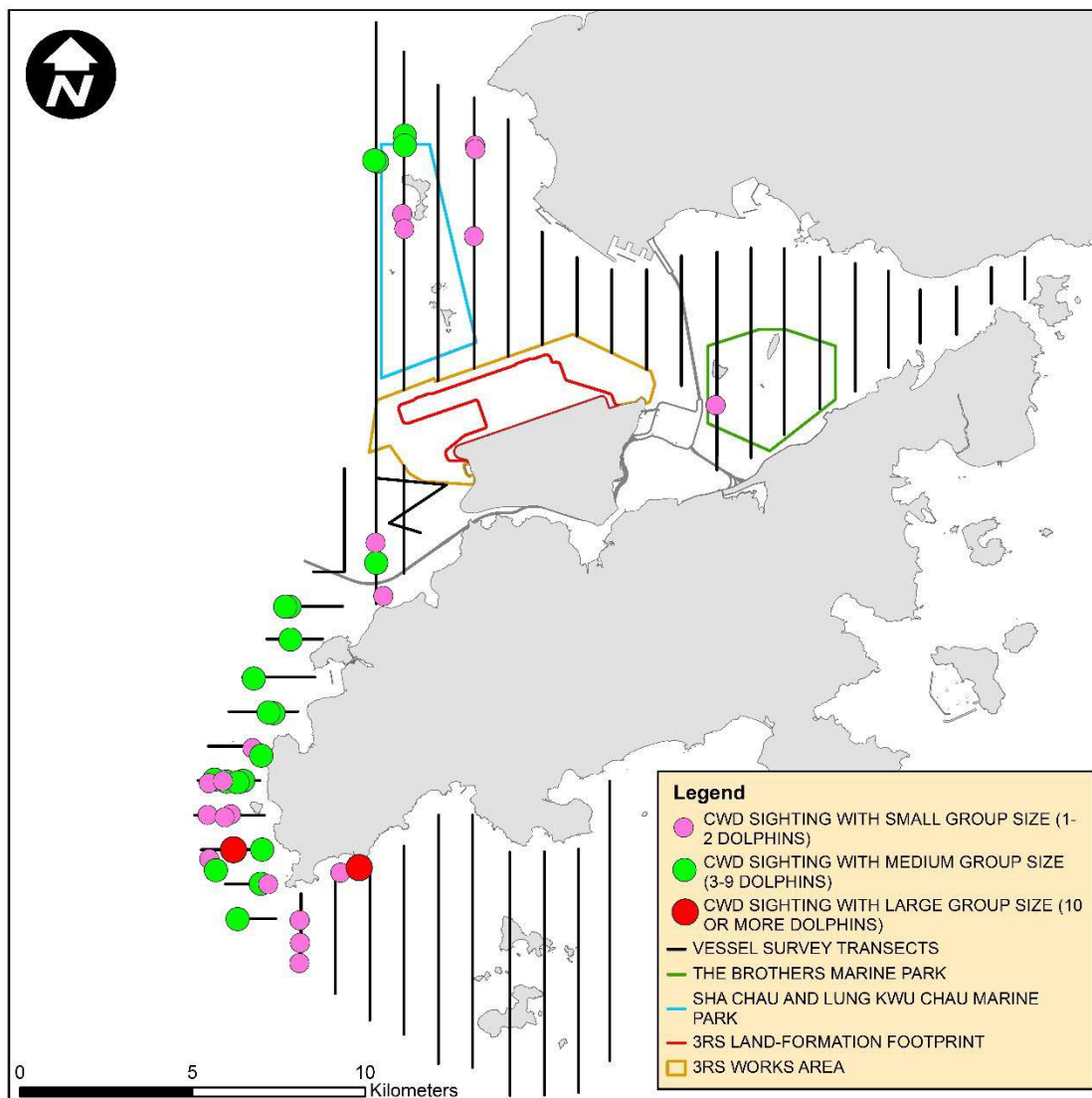
Note: For detailed calculations of encounter rates STG and ANI, please refer to the Construction Phase Monthly EM&A Report No. 34, 35 and 36.

Group Size

Between October and December 2018, the group size of CWD sightings ranged from 1 to 11 dolphins. The average group size of CWDs was 3.3 dolphins per group while that of the last quarter was 3.1, which is quite similar. The average group size of CWDs in this reporting quarter is slightly lower than that of the same quarter of last year (3.6 dolphins per group).

In this reporting quarter, the numbers of CWD sightings with small group size (i.e. 1-2 dolphins) and medium group size (i.e. 3-9 dolphins) were the same. Amongst all 42 sightings, there were two sightings with large group size (i.e. 10 or more dolphins). These two large CWD groups were sighted in WL and SWL respectively. Sighting locations of CWD groups with different group sizes are depicted in **Figure 2.6**.

In NWL, medium-sized CWD groups tended to appear in the waters north to Lung Kwu Chau. In WL, CWD sightings with medium group size were scattered over the survey area while small-sized groups were mostly recorded around Peaked Hill. The larger CWD group encountered in WL was recorded in waters between Peaked Hill and Fan Lau. In SWL, all sightings were small-sized except for one large CWD group, and all these groups were restricted to western side of the survey area.

Figure 2.6: Sighting Locations of Chinese White Dolphins with Different Group Sizes

Remarks: Please note that there are 42 circles on the map indicating the sighting locations of CWD. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

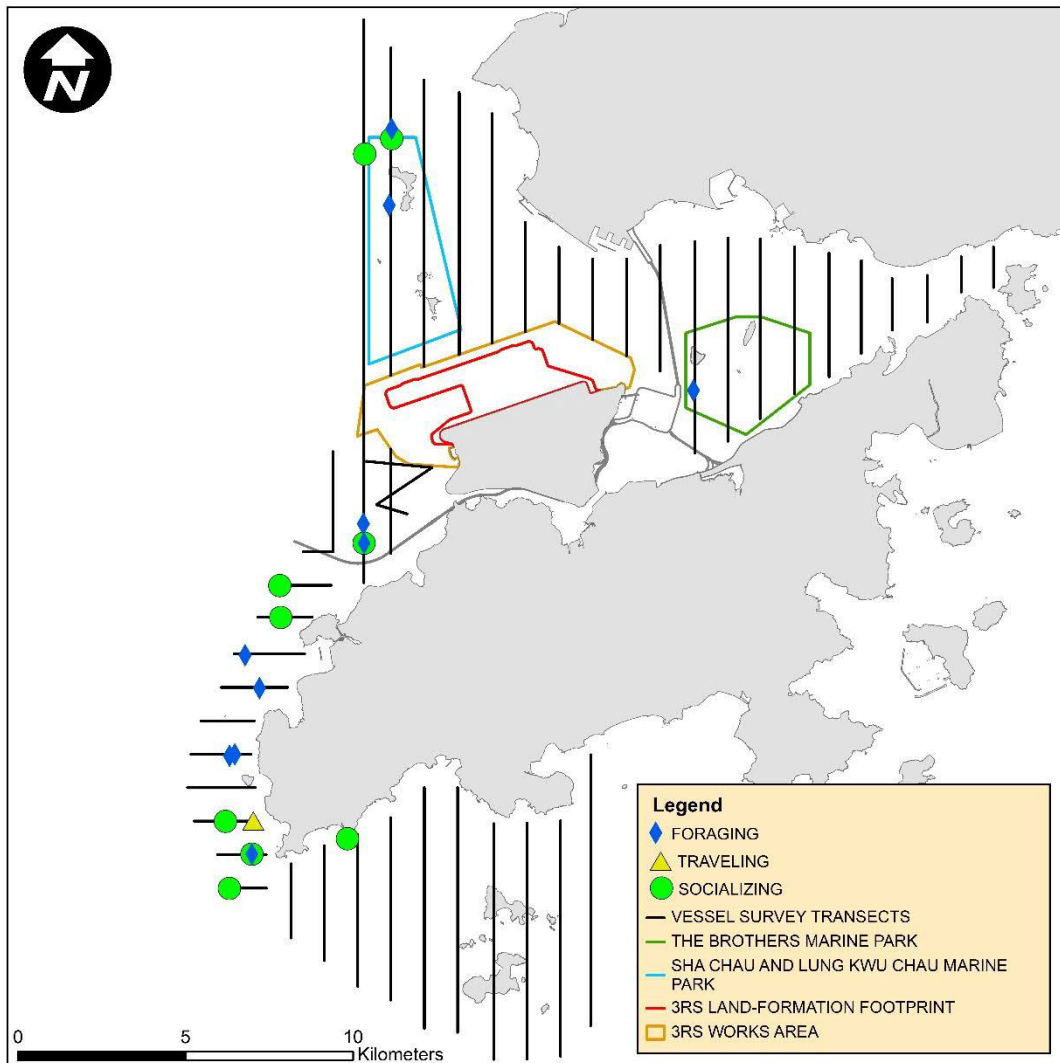
Activities and Association with Fishing Boats

During October to December 2018, 10 sightings of CWDs were recorded with feeding activities. None of these sightings was observed in association with operating fishing boats.

The number of sightings with feeding recorded in the current reporting period is slightly lower when compared to the last reporting period (12 sightings involved feeding activities with no association with operating fishing boats from July to September 2018).

Compared with the data in the same quarter of last year, CWD sightings with feeding activities decreased by 4 sightings. The sighting locations of CWDs engaged in different behaviours during the current reporting period are illustrated in **Figure 2.7**.

Figure 2.7: Sighting Locations of Chinese White Dolphins Engaged in Different Behaviours



Mother-calf Pairs

From October to December 2018, 10 sightings of CWDs were recorded with the presence of mother-and-unspotted calf, mother-and-unspotted juvenile and/or mother-and-spotted juvenile, which is slightly fewer than the last reporting quarter (i.e. 11 sightings between July and September 2018). The number is higher than the same quarter of last year (i.e. 8 sightings between October and December 2017). These pairs were sighted in NWL, WL and SWL survey areas as shown in **Figure 2.8**.

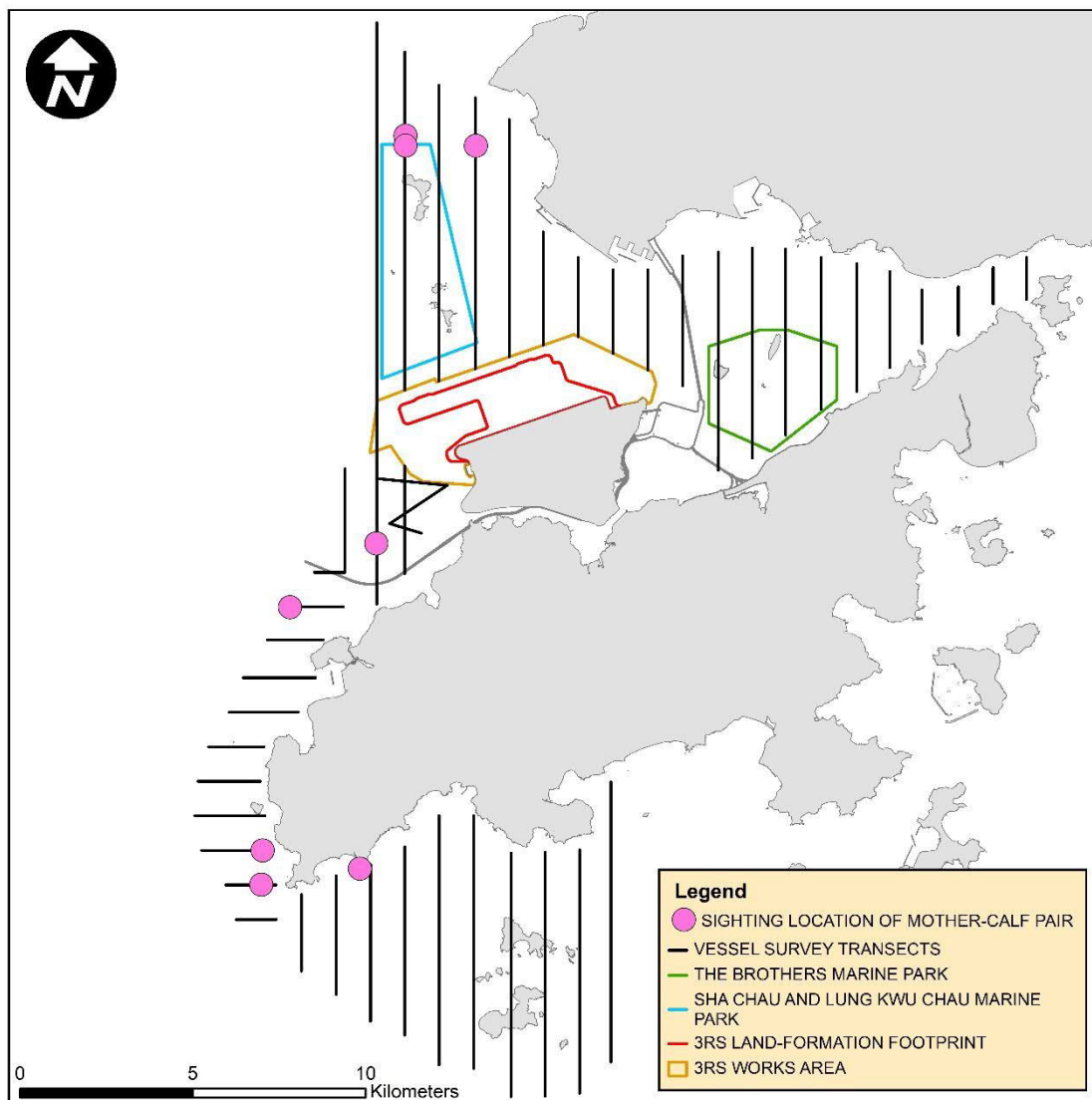
Figure 2.8: Sighting Locations of Mother-calf Pairs

Photo Identification

During October to December 2018, a total number of 62 different CWD individuals were identified altogether for 95 times. Re-sighting information of CWD individuals provides an initial idea of their range use and apparent connection between different areas around Lantau. Amongst these 62 different CWD individuals, 23 animals (i.e. NLMM004, NLMM006, NLMM013, NLMM015, NLMM018, NLMM023, NLMM063, SLMM003, SLMM007, SLMM014, SLMM028, SLMM053, WLMM001, WLMM028, WLMM029, WLMM056, WLMM060, WLMM065, WLMM071, WLMM078, WLMM079, WLMM114 and WLMM127) were sighted for more than once.

Seven individuals including NLMM063, SLMM014, SLMM028, WLMM001, WLMM060, WLMM071 and WLMM114 were re-sighted in different survey areas during this reporting period. Amongst these seven animals, NLMM063, SLMM028, WLMM060 and WLMM071 had cross-area movement between NWL and WL survey areas, whilst SLMM014, WLMM001 and WLMM114 had cross-area movement between WL and SWL. The most frequently re-sighted individual in

this reporting quarter was WLMM001 which has been encountered in each month of the current reporting quarter for altogether 6 times. The number of re-sighted CWD individuals and the number of CWD individuals showing cross-area movement from October to December 2018 were both lower than the last reporting quarter.

A summary of photo identification works is presented in **Table 2.23**. Representative photos of the 62 identified individuals and figures depicting the sighting locations of the aforementioned 23 re-sighted individuals recorded in this reporting period are presented **Appendix C**.

Table 2.23: Summary of Photo Identification

| Individual ID | Date of sighting | Sighting Group No. | Area | Individual ID | Date of sighting | Sighting Group No. | Area |
|---------------|------------------|--------------------|------|---------------|------------------|--------------------|------|
| NLMM002 | 8-Oct-18 | 3 | NWL | SLMM053 | 21-Dec-18 | 1 | WL |
| NLMM004 | 8-Oct-18 | 4 | NWL | | | 2 | WL |
| | 6-Nov-18 | 2 | NWL | SLMM059 | 20-Nov-18 | 3 | WL |
| NLMM006 | 8-Oct-18 | 5 | NWL | SLMM067 | 4-Dec-18 | 1 | SWL |
| | 6-Nov-18 | 2 | NWL | WLMM001 | 24-Oct-18 | 2 | WL |
| NLMM012 | 6-Nov-18 | 1 | NWL | | 16-Nov-18 | 8 | WL |
| NLMM013 | 8-Oct-18 | 5 | NWL | | 4-Dec-18 | 1 | SWL |
| | 6-Nov-18 | 2 | NWL | | 20-Dec-18 | 1 | WL |
| NLMM015 | 8-Oct-18 | 1 | NWL | | 21-Dec-18 | 1 | WL |
| | | 3 | NWL | | | 2 | WL |
| NLMM018 | 20-Nov-18 | 2 | WL | WLMM007 | 16-Nov-18 | 8 | WL |
| | | 3 | WL | WLMM018 | 20-Nov-18 | 4 | WL |
| NLMM019 | 4-Oct-18 | 5 | WL | WLMM019 | 8-Oct-18 | 1 | NWL |
| NLMM020 | 4-Oct-18 | 5 | WL | WLMM028 | 21-Dec-18 | 1 | WL |
| NLMM023 | 5-Oct-18 | 1 | NWL | | | 2 | WL |
| | 12-Nov-18 | 2 | NWL | WLMM029 | 21-Dec-18 | 1 | WL |
| NLMM037 | 6-Nov-18 | 2 | NWL | | | 2 | WL |
| NLMM039 | 6-Nov-18 | 1 | NWL | WLMM043 | 4-Oct-18 | 1 | WL |
| NLMM040 | 8-Oct-18 | 3 | NWL | WLMM056 | 24-Oct-18 | 1 | WL |
| NLMM041 | 8-Oct-18 | 3 | NWL | | 20-Nov-18 | 3 | WL |
| NLMM043 | 5-Oct-18 | 1 | NWL | WLMM060 | 4-Oct-18 | 5 | WL |
| NLMM052 | 12-Nov-18 | 2 | NWL | | 24-Oct-18 | 2 | WL |
| NLMM058 | 8-Oct-18 | 1 | NWL | | 12-Nov-18 | 1 | NWL |
| NLMM059 | 12-Oct-18 | 1 | NEL | WLMM063 | 16-Nov-18 | 3 | WL |
| NLMM063 | 4-Oct-18 | 5 | WL | WLMM065 | 4-Oct-18 | 1 | WL |
| | 8-Oct-18 | 1 | NWL | | 24-Oct-18 | 1 | WL |
| | | 3 | NWL | WLMM069 | 4-Dec-18 | 1 | SWL |
| NLMM068 | 6-Nov-18 | 2 | NWL | WLMM071 | 4-Oct-18 | 5 | WL |
| SLMM003 | 16-Nov-18 | 1 | WL | | 24-Oct-18 | 2 | WL |
| | 20-Nov-18 | 2 | WL | | 12-Nov-18 | 1 | NWL |
| SLMM007 | 24-Oct-18 | 2 | WL | WLMM073 | 21-Dec-18 | 1 | WL |
| | 16-Nov-18 | 1 | WL | WLMM078 | 21-Dec-18 | 1 | WL |
| SLMM010 | 4-Dec-18 | 1 | SWL | | | 2 | WL |
| SLMM012 | 4-Dec-18 | 1 | SWL | WLMM079 | 16-Nov-18 | 1 | WL |
| SLMM014 | 21-Nov-18 | 1 | SWL | | | 8 | WL |
| | | 3 | SWL | WLMM080 | 21-Dec-18 | 1 | WL |
| | 4-Dec-18 | 1 | SWL | WLMM089 | 5-Oct-18 | 1 | NWL |
| | 21-Dec-18 | 2 | WL | WLMM109 | 16-Nov-18 | 8 | WL |
| SLMM019 | 4-Dec-18 | 1 | SWL | WLMM114 | 4-Oct-18 | 3 | WL |
| SLMM022 | 4-Dec-18 | 1 | SWL | | 4-Dec-18 | 2 | SWL |
| SLMM027 | 4-Oct-18 | 3 | WL | WLMM119 | 24-Oct-18 | 2 | WL |

| Individual ID | Date of sighting | Sighting Group No. | Area | Individual ID | Date of sighting | Sighting Group No. | Area |
|---------------|------------------|--------------------|------|---------------|------------------|--------------------|------|
| SLMM028 | 20-Nov-18 | 1 | WL | WLMM125 | 20-Nov-18 | 3 | WL |
| | 3-Dec-18 | 1 | NWL | WLMM127 | 8-Oct-18 | 1 | NWL |
| SLMM030 | 21-Dec-18 | 1 | WL | | | 2 | NWL |
| SLMM034 | 21-Nov-18 | 2 | SWL | | 6-Nov-18 | 2 | NWL |
| SLMM037 | 20-Nov-18 | 2 | WL | WLMM130 | 24-Oct-18 | 2 | WL |
| SLMM044 | 4-Oct-18 | 5 | WL | WLMM131 | 20-Nov-18 | 2 | WL |
| SLMM052 | 16-Nov-18 | 1 | WL | | | | |

2.5.2.2 Land-based Theodolite Tracking Survey

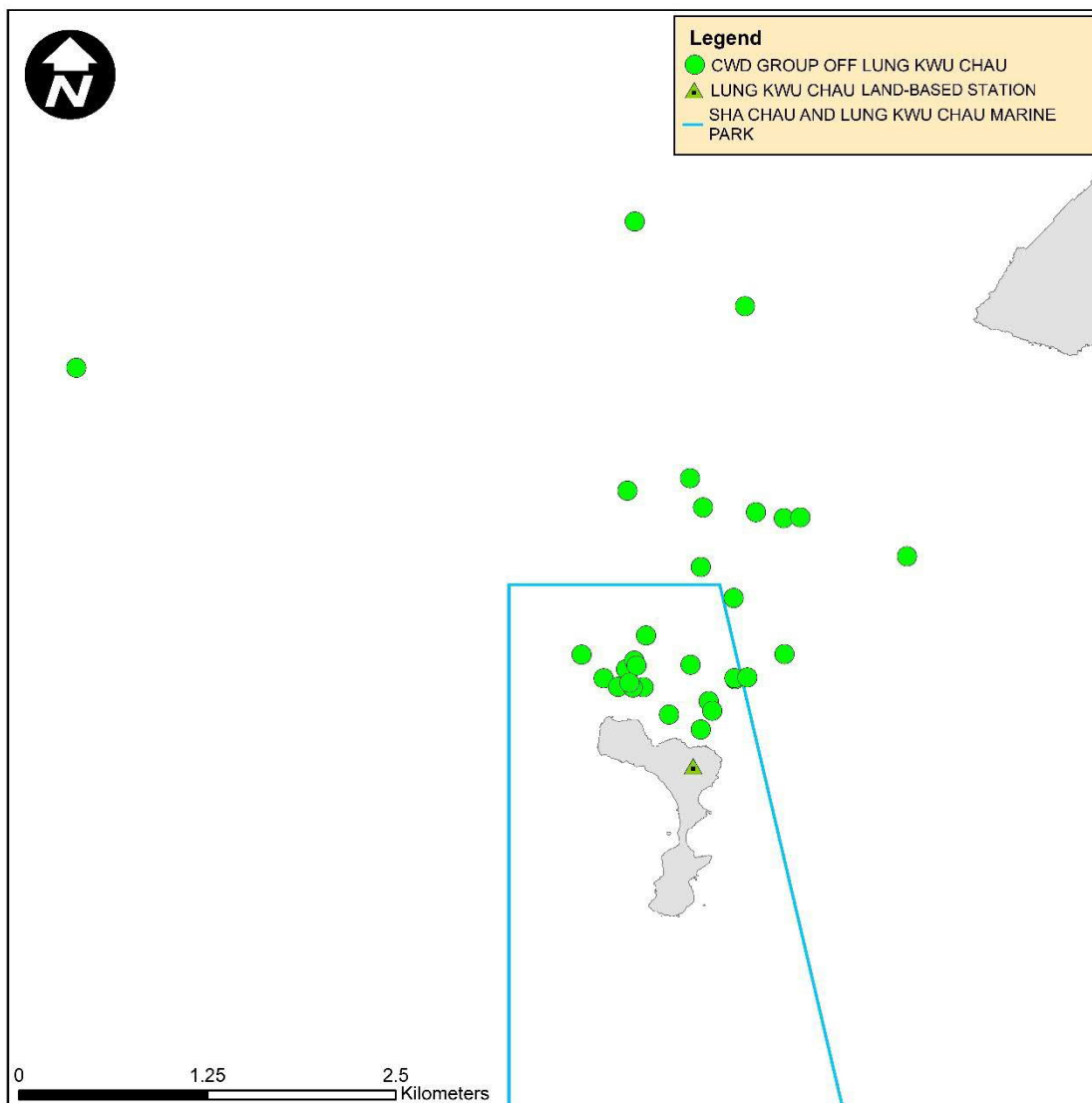
Survey Effort

During October to December 2018, a total of 15 days of land-based theodolite tracking survey effort were completed, including nine days on Lung Kwu Chau and six days on Sha Chau. In total, 31 CWD groups were tracked from the Lung Kwu Chau station while no CWD groups were tracked from the Sha Chau station, with an overall 0.34 CWD groups sighted per survey hour.

Information on survey effort and CWD groups sighted during land-based theodolite tracking surveys are presented in **Table 2.24**. Details on the survey effort and CWD groups tracked are presented in **Appendix C**. The first sighting locations of CWD groups tracked between October and December 2018 are shown in **Figure 2.9**.

Table 2.24: Summary of Survey Effort and CWD Group of Land-based Theodolite Tracking Survey

| Land-based Station | # of Survey Sessions | Survey Effort (hh:mm) | # CWD Groups Sighted | CWD Group Sighting per Survey Hour |
|----------------------|----------------------|-----------------------|----------------------|------------------------------------|
| October 2018 | | | | |
| Lung Kwu Chau | 3 | 18:00 | 11 | 0.61 |
| Sha Chau | 2 | 12:00 | 0 | 0 |
| TOTAL | 5 | 30:00 | 11 | 0.37 |
| November 2018 | | | | |
| Lung Kwu Chau | 3 | 18:00 | 12 | 0.67 |
| Sha Chau | 2 | 12:00 | 0 | 0 |
| TOTAL | 5 | 30:00 | 12 | 0.40 |
| December 2018 | | | | |
| Lung Kwu Chau | 3 | 18:00 | 8 | 0.44 |
| Sha Chau | 2 | 12:00 | 0 | 0 |
| TOTAL | 5 | 30:00 | 8 | 0.27 |
| OVERALL | 15 | 90:00 | 31 | 0.34 |

Figure 2.9: Plots of First Sightings of All CWD Groups from Land-based Stations

Remarks: Please note that there are 31 green circles on the map indicating the first sighting locations of CWD groups tracked off Lung Kwu Chau. Some of them were very close to each other and therefore appear overlapped on this map.

2.5.2.3 Progress Update on PAM

An Ecological Acoustic Recorder (EAR) has been deployed and positioned to the south of Sha Chau Island inside the SCLKCMP (**Figure 2.10**) with 20% duty cycle, while data from the EAR intended primarily to supplement the data collected from the land-based theodolite tracking survey station on Sha Chau. In this reporting period, the EAR has been retrieved on 16 October and 28 November 2018 for data collection and subsequently redeployed. The EAR deployment is generally for 6 weeks prior to data retrieval for analysis. As the period of data collection and analysis takes more than four months, PAM results could not be reported in quarterly intervals but report for supplementing the annual CWD monitoring analysis.

2.5.2.4 Site Audit for CWD-related Mitigation Measures

During the reporting period, silt curtains were in place by the contractors for sand blanket laying and marine filling works, in which dolphin observers were deployed by each contractor in accordance with the Marine Mammal Watching Plan (MMWP). Teams of at least two dolphin observers were deployed at 12 to 18 dolphin observation stations by the contractors for continuous monitoring of the DEZ by all contractors for ground improvement works (DCM works and PVD installation) and seawall construction in accordance with the DEZ Plan. Trainings for the proposed dolphin observers on the implementation of MMWP and DEZ monitoring were provided by the ET prior to the aforementioned works, with a cumulative total of 677 individuals being trained and the training records kept by the ET. Observations were recorded on DEZ monitoring in this reporting period during site inspection by the ET and IEC. The contractors had taken actions to implement the recommended measures. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals were observed within or around the silt curtains or the DEZ in this reporting period. The contractors' records were also audited by the ET during site inspection.

Audits of acoustic decoupling for construction vessels were carried out during weekly site inspection and summarized in **Section 2.6**. Summary of audits of SkyPier HSFs route diversion and speed control and construction vessel management are presented in **Section 2.8** and **Section 2.9** respectively.

2.6 Environmental Site Inspection

Site inspections of the construction works were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. Bi-weekly site inspections were also conducted by the IEC. Besides, *ad-hoc* site inspections were conducted by ET and IEC if environmental problems were identified, or subsequent to receipt of an environmental complaint, or as part of the investigation work. These site inspections provided a direct means to reinforce the specified environmental protection requirements and pollution control measures in construction sites.

During site inspections, environmental situation, status of implementation of pollution control and mitigation measures were observed. Environmental documents and site records, including waste disposal record, maintenance record of environmental equipment, and relevant environmental permit and licences, were also checked on-site. Observations were recorded in the site inspection checklist and passed to the contractor together with the appropriate recommended mitigation measures where necessary in order to advise contractors on environmental improvement, awareness and on-site enhancement measures. The observations were made with reference to the following information during the site inspections:

- The EIA and EM&A requirements;
- Relevant environmental protection laws, guidelines, and practice notes;
- The EP conditions and other submissions under the EP;
- Monitoring results of EM&A programme;
- Works progress and programme;
- Proposal of individual works;
- Contract specifications on environmental protection; and
- Previous site inspection results.

Good site practices were implemented in the project to enhance environmental performance. Key examples are highlighted here:

1. In order to maximise the utilisation of public fill, sorting facilities were set up in Tseung Kwan O Fill Bank (TKOFB) in 2018. AAHK is in close liaison with government departments on measures to facilitate the intake of the public fill material from TKOFB. Another sorting facility is being set up in Tuen Mun Fill Bank to step up the use of public fill materials in reclamation works, with target commencement of operation in the first quarter of 2019. With the setting up of more sorting facilities, AAHK aims to maximise the intake of suitable public fill materials in the 3RS project. Suitable C&D materials generated from other AAHK's projects and local infrastructure projects are also being used as fill in reclamation works of 3RS Project.
2. In December 2018, a contractor of DCM contract started using a closed-circuit television (CCTV) system combining high-resolution network cameras with high definition televisions (HDTV) and a management software to implement continuous DEZ monitoring instead of deploying dolphin observers on barges. The network cameras were fixed on DCM barges to overlook the DEZ, while dolphin observers monitored the live views of all DEZs at a work station in the site office comprising large HDTV displays. The weatherproof and high image quality cameras capture views of all DEZs for the monitoring by dolphin observers in daytime, night-time and even during adverse weather conditions. The CCTV system allows dolphin observers to control camera(s) for searching dolphin and to capture image from the live view whenever there is presence of suspected dolphin within or near the DEZ. The dolphin observers could inform the site supervision team immediately to instruct suspension of the works directly in the site office when dolphin was observed within the DEZ.
3. From July 2018, the AAHK launched an Environmental Recognition Scheme for 3RS work contracts to promote environmental awareness and good environmental practices in construction sites. Four contractors have been awarded for their good environmental performance. The assessment criteria include site performance, environmental submissions, training effort to frontline staff, worker environmental awareness and outstanding environmental practices. Assessments were carried out in a quarterly basis.

| | | |
|--|---|---|
|  <p>Sorting facilities at TKOFB</p> |  <p>Monitoring of DEZs through CCTV system by contractor</p> |  <p>Environmental Recognition Scheme – effective dust suppression in tight work area and schedule environment</p> |
|--|---|---|

Besides, advices were given when necessary to ensure the construction workforce were familiar with relevant procedures, and to maintain good environmental performance on site. Regular toolbox talks on environmental issues were organized for the construction workforce by the contractors to ensure understanding and proper implementation of environmental protection and pollution control mitigation measures.

During the reporting period, implementation of recommended landscape and visual mitigation measures (CM1 – CM10) where applicable was monitored weekly in accordance with the Manual and no non-conformity was recorded. In case of non-conformity, specific recommendations will be made, and actions will be proposed according to the Event and Action Plan. The monitoring status is summarized in **Appendix B**.

A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix B**.

2.7 Terrestrial Ecological Monitoring

Monthly ecological monitoring was carried out in October, November and December 2018 on Sheung Sha Chau Island in accordance with the Manual. No encroachment of any works upon the egret area nor any significant disturbance to the ardeids foraging at Sheung Sha Chau by the works were recorded during ecological monitoring. No signs of breeding or nursery activities were observed. At the HDD daylighting location, neither nest nor breeding activity of ardeids were found during the monthly ecological monitoring and weekly site inspections from October to December 2018. The site photos and location map regarding the ecological monitoring for HDD daylighting location and egret area are provided in **Appendix C** for reference.

2.8 Audit of SkyPier High Speed Ferries

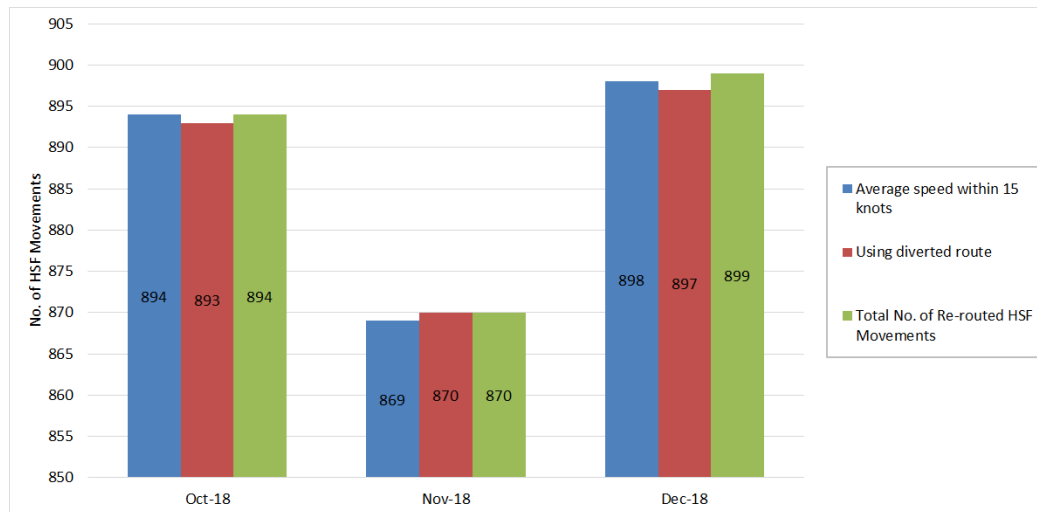
In total, 2,663 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. The daily movements of all SkyPier HSFs in the reporting period ranged between 86 and 102, which fell within the maximum daily cap number of 125.

The average speeds of all HSFs travelling through the Speed Control Zone (SCZ) ranged from 9.0 to 20.3 knots. Except two cases (one case on 06 November 2018 and one case on 18 December 2018), all HSFs travelled through the SCZ with average speed within 15 knots in compliance with the Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier (the SkyPier Plan). For the case on 06 November 2018, ET reviewed the supplementary response provided by ferry operator and agreed the speeding was due to ferry operator fault. For the case on 18 December 2018, ET's investigation found that the deviation was due to giving way to a lot of fishing vessels.

Two ferry movements were recorded with minor deviations from the diverted route. Notices of deviation were sent to the ferry operators and the cases were investigated. The cases involved giving way to other vessels to ensure public safety, and the HSFs had returned to the normal route following the SkyPier Plan as soon as practicable after the incidents.

One ferry movement was recorded with deviations from the diverted route. The case involved a vessel suffering from serious rolling and pitching after failure of water jet pump, and the captain decided to finish the trip not via the SCZ to minimize travelling time and ensure safety. The summary of the SkyPier Plan monitoring result is presented in **Graph 3**.

Insufficient or no AIS data cases were received from some HSFs during the reporting period. After investigation, it was found that AIS data for the concerned ferries were missing due to signal interference as reported by the ferry operators after checking the condition of the AIS transponders. Vessel captains were requested to provide the radar track photos which indicated the vessels entered the SCZ through the gate access points and there was no speeding in the SCZ. Ferry operators' explanations were accepted.

Graph 3: Summary of SkyPier High Speed Ferries Monitoring Results

2.9 Audit of Construction and Associated Vessels

On the implementation of the updated Marine Travel Routes and Management Plan for Construction and Associated Vessels (MTRMP-CAV), the Marine Surveillance System (MSS) automatically recorded deviation cases such as speeding, entering no entry zone, and not traveling through the designated gates. ET conducted bi-weekly audit of relevant information including AIS data, vessel tracks and other relevant records to ensure sufficient information were provided by the system and the contractors complied with the requirements of the MTRMP-CAV. The contractors submitted endorsed 3-month rolling vessel plans for construction vessel activities to AAHK in order to help maintain the number of construction vessels to a practicable minimum. The IEC also performed audit on the compliance of the requirements as part of the EM&A programme.

During the reporting period, deviations including speeding in the works area, entry from non-designated gates, and entering no-entry zones were identified. All the concerned captains were reminded by the contractor's MTCC representative to comply with the requirements of the MTRMP-CAV.

A total of 5 skipper training workshops were held by ET during the reporting period with 18 concerned captains of construction vessels associated with the 3RS contracts to familiarise them with the predefined routes, general education on local cetaceans, guidelines for avoiding adverse water quality impact, the required environmental practices / measures while operating construction and associated vessels under the Project, and guidelines for operating vessels safely in the presence of CWDs. Another 11 skipper training workshops were held with 18 captains by contractors' Environmental Officers and competency tests were conducted subsequently with the trained captains by ET. It was observed that the number of deviation cases has gradually declined, which shows the reminders issued to and refresher training sessions provided by the Contractors had reinforced the skippers to follow the MTRMP-CAV requirements with improved performance.

2.10 Coral Post-Translocation Monitoring

In accordance with the approved Coral Translocation Plan (CTP), gorgonian corals suitable for translocation were translocated to the recipient site at Yam Tsai Wan (YTW), with translocation completed in January 2017. Since then the post-translocation monitoring programme has been undertaken and was completed in April 2018. Two additional monitoring surveys (beyond the CTP requirement) scheduled in October 2018 and April 2019 were proposed in the Detailed Coral Translocation Report. This quarterly report presents the results of the 7th post-translocation monitoring survey completed in October 2018 (**Table 2.25** below).

Table 2.25: Summary of the 7th Post-Translocation Monitoring Survey

| | General Health Conditions ^(a) | % Change in Partial Mortality ^{(b)(c)} | Triggering Action Level ^(d) | Triggering Limit Level ^(e) |
|--|--|--|--|---------------------------------------|
| Seventh Round of Survey in October 2018 | | | | |
| Control gorgonian corals (tagged) | 0-3 (Average: 1.6) | <25% change for 0% of the tagged corals and ≥25% for 94% of the tagged corals (Average PM: 71.1%) | No | No |
| Translocated gorgonian corals (tagged) | 0-4 (Average: 2.2) | <25% change for 5% of the tagged corals and ≥25% for 95% of the tagged corals (Average PM: 74.6%) | | |

Notes:

- (a) General health conditions of coral were measured on an ordinal scale of 0 to 5 (0=dead, 5=very healthy).
- (b) The percentage change in partial mortality of the tagged translocated and control corals are both determined by comparing the partial mortality recorded during each post-translocation monitoring with reference to the partial mortality observed during the baseline conditions, as represented by the tagged coral survey results. As with previous Quarterly EM&A Reports, the partial mortality is calculated based on baseline total length of each colony.
- (c) Coral showing no change in partial mortality is not presented in this account.
- (d) As defined in the approved CTP, the Action Level is triggered if during monitoring a 15% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.
- (e) As defined in the approved CTP, the Limit Level is triggered if during monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.

On 16 September 2018, one month prior to the survey, Typhoon Mangkhut hit Hong Kong with wind speeds up to 250 km/h. Many areas in Hong Kong including the recipient site were affected. As a result, two control coral colonies and 25 translocated coral colonies were lost. Therefore, only 18 control corals colonies and 60 translocated colonies were surveyed.

Based on the results of the 7th post-translocation monitoring, ≥25% change was recorded on 57 out of 60 translocated corals (95% of the tagged translocated coral colony that were surveyed). Similarly, ≥25% change was recorded on 17 out of 18 control corals (94% of the tagged control coral colony that were surveyed) and no change in PM was recorded on one control coral. The health condition ranged from 0 to 3 for control corals and 0 to 4 for translocated corals. Other than the coral colonies that have been swept away during typhoon Mangkhut, the coral colonies (both control and translocated) that remain at the site have shown similar partial mortality to those

recorded in April 2018 showing that the condition of coral colonies appear to have stabilized. Action and Limit Levels were not triggered during this round of monitoring.

2.11 Review of the Key Assumptions Adopted in the EIA Report

With reference to Appendix E of the Manual, it is noted that the key assumptions adopted in approved EIA report for the construction phase are still valid and no major changes are involved. The environmental mitigation measures recommended in the approved EIA Report remain applicable and shall be implemented in undertaking construction works for the Project.

3 Report on Non-compliance, Complaints, Notifications of Summons and Prosecutions

3.1 Compliance with Other Statutory Environmental Requirements

During the reporting period, environmental related licenses and permits required for the construction activities were checked. No non-compliance with environmental statutory requirements was recorded.

3.2 Analysis and Interpretation of Complaints, Notification of Summons and Status of Prosecutions

3.2.1 Complaints

One environmental complaint was received in the reporting period. All environmental complaints were attended to and investigation was conducted by the ET in accordance with the Manual and the Complaint Management Plan. The summary of the complaints and analysis is presented in **Table 3.1**.

Table 3.1: Summary of Environmental Complaints

| Date of Complaint Received | Details | Analysis / Remedial Actions | Status |
|----------------------------|--|--|--------|
| 6 Nov 2018 | A complaint was received on 6 Nov 2018 regarding dust nuisance from sand barges at Tuen Mun. | Investigation was conducted by the ET in accordance with the Manual and the Complaint Management Plan of the Project. The anonymous complainant did not provide any specific information (e.g. date, time, name of vessels) on the case. In recent months, only one contractor has deployed sand delivery vessels for 3RS Project, and photo records of implementation of dust mitigation measure, such as water spraying, were provided by the contractor. Considering that Tuen Mun Anchorage Area is one of the designated anchorage areas for all vessels in Hong Kong waters, including construction vessels of various construction projects. Based on the information provided by the complainant, there were no evidences suggesting that the Project's sand delivery vessels caused dust nuisance to nearby residence at Tuen Mun. Nevertheless, ET will continue reminding all contractors to continue the implementation of dust mitigation measures and to conduct regular training for all frontline staff to avoid dust nuisance to the public. ET will also continue to monitor the implementation of dust mitigation measures. | Closed |

3.2.2 Notifications of Summons or Status of Prosecution

No notification of summons nor prosecution was received during the reporting period.

3.3 Cumulative Statistics

Cumulative statistics on valid exceedance, non-compliance, complaints, notifications of summons and status of prosecutions are summarized in **Table 3.2** and **Table 3.3**.

Table 3.2: Statistics for Valid Exceedances for the Environmental Monitoring

| | | Total No. Recorded in the Reporting Period | Total No. Recorded since the Project Commenced |
|----------|--------------|--|--|
| 1-hr TSP | Action Level | 0 | 0 |
| | Limit Level | 0 | 0 |
| Noise | Action Level | 0 | 0 |
| | Limit Level | 0 | 0 |
| Waste | Action Level | 0 | 0 |
| | Limit Level | 0 | 0 |
| Water | Action Level | 0 | 0 |
| | Limit Level | 0 | 0 |
| CWD | Action Level | 0 | 0 |
| | Limit Level | 0 | 0 |

Remark: Non-project related triggers of Action or Limit Level are not shown in this table.

Table 3.3: Statistics for Non-compliance, Complaints, Notifications of Summons and Prosecution

| Reporting Period | Cumulative Statistics | | | |
|--|-----------------------|------------|--------------------------|--------------|
| | Non-compliance | Complaints | Notifications of Summons | Prosecutions |
| This reporting period | 0 | 1 | 0 | 0 |
| From 28 December 2015 to end of the reporting period | 0 | 16 | 1 | 1 |

4 Conclusion and Recommendation

In this quarterly period from 1 October 2018 to 31 December 2018, the EM&A programme has been implemented as planned, including 96 sets of air quality measurements, 52 sets of construction noise measurements, 39 sets of water quality measurements, 6 complete sets of vessel line transect surveys and 15 days of land-based theodolite tracking survey effort for CWD monitoring, 3 rounds of terrestrial ecological monitoring, 1 set of additional coral post-translocation monitoring, as well as environmental site inspections and waste monitoring for the Project's construction works.

The key activities of the Project carried out in the reporting period included reclamation works and land-side works. Reclamation works included DCM works, marine filling, seawall construction, laying of sand blanket, and PVD installation. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for APM and BHS, and preparation work for utilities, with activities include site establishment, site office construction, road and drainage works, cable ducting, demolition of existing facilities, piling, and excavation works.

Monitoring results of construction dust, construction noise, construction waste, CWD, and coral post-translocation monitoring did not trigger the corresponding Action and Limit Levels in the reporting period. All site observations made by the ET were recorded in the site inspection checklists and passed to the contractor together with the recommended follow-up actions.

For water quality, the water quality monitoring results for DO and total alkalinity obtained during the reporting period did not trigger their corresponding Action and Limit Levels stipulated in the EM&A programme. Relevant investigation and follow-up actions will be conducted according to the EM&A programme if the corresponding Action and Limit Levels are triggered. For turbidity, SS, chromium, and nickel, some of the testing results triggered the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that the cases were not due to the Project. To conclude, the construction activities in the reporting period did not introduce adverse impact to all water quality sensitive receivers.

In total, 2,663 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. Except the two cases (one case on 06 November 2018, and one case on 18 December 2018), all HSFs travelled through the SCZ with average speed within 15 knots in compliance with the SkyPier Plan. Three ferry movements had deviations from the diverted route during the reporting period, where two of them were minor deviations. ET investigated the deviation cases and confirmed that all of them were related to public safety or emergency situations.

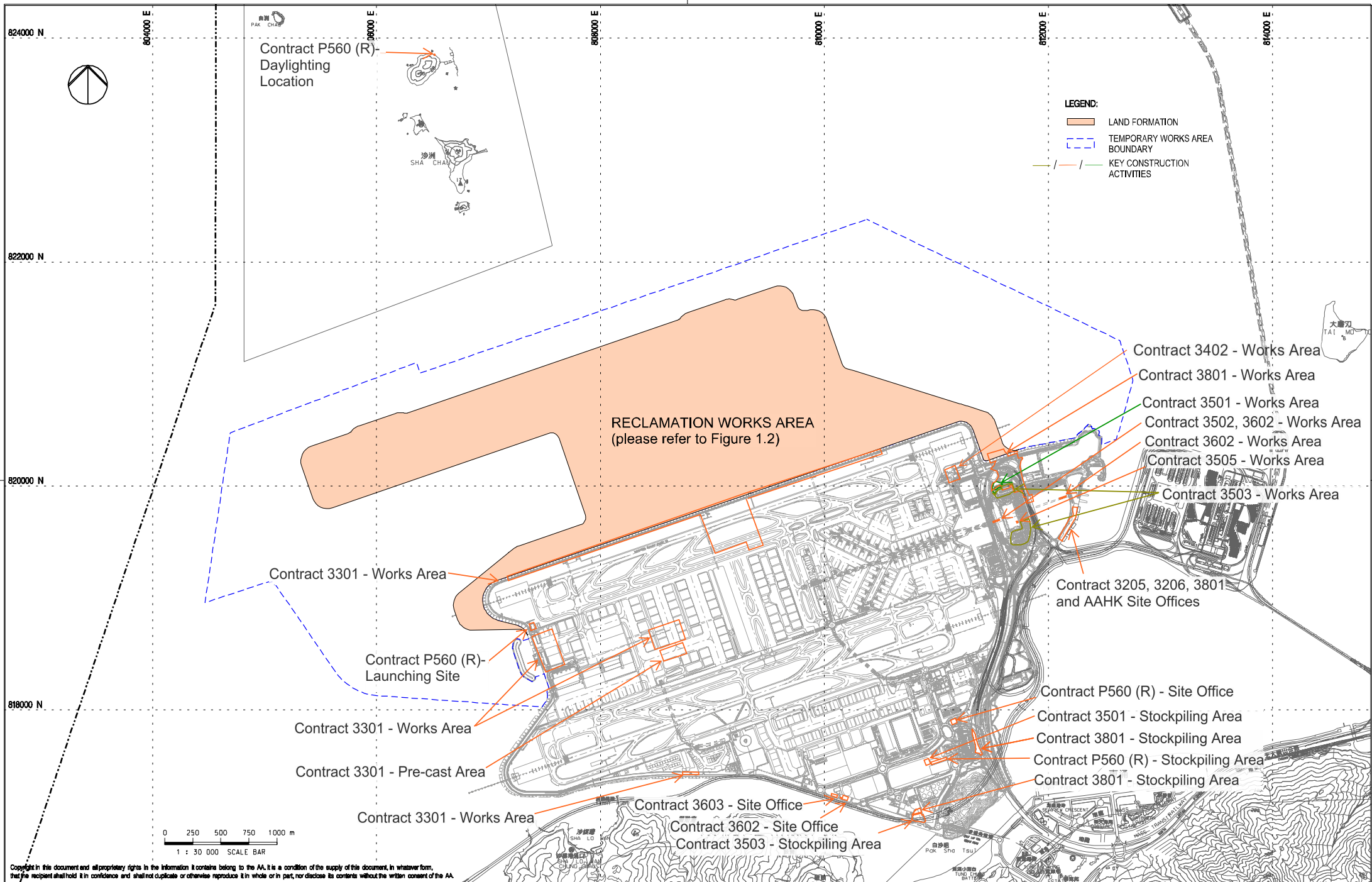
During the reporting period, ET conducted bi-weekly audit of the MSS to ensure the system recorded all deviation cases accurately and the contractors fully complied with the requirements of the MTRMP-CAV. A total of five skipper training workshops were held by ET during the reporting period for captains of construction vessels associated with 3RS contracts. Another 11 skipper training workshops were held by contractors' Environmental Officers and competency tests were conducted subsequently with the trained captains by ET.

On the implementation of MMWP, dolphin observers were deployed by the contractors for laying of silt curtains for sand blanket and marine filling works in accordance with the plan. On the implementation of DEZ Plan, dolphin observers were deployed for continuous monitoring of the

DEZ by the contractors for ground improvement works (DCM works and PVD installation) and seawall construction in accordance with the DEZ Plan. Trainings for the proposed dolphin observers were provided by the ET prior to the aforementioned works, with the training records kept by the ET. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals were observed within or around the silt curtains or the DEZ in this reporting period. Audits of acoustic decoupling for construction vessels were also carried out by ET.

The recommended environmental mitigation measures, as included in the EM&A programme, were effectively implemented during the reporting period. Also, the EM&A programme implemented by the ET has effectively monitored the construction activities and ensured the proper implementation of mitigation measures.

Figures



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|------|---------|-------------|---------|
| A | 31AUG16 | FIRST ISSUE | DC |
| | | | |
| | | | |
| | | | |



Title
LOCATIONS OF KEY CONSTRUCTION ACTIVITIES

| Consultant's Signatures for Approval | | Date |
|--------------------------------------|-----|---------|
| Design | DC | 31AUG16 |
| Checkers | DC | 31AUG16 |
| Design Supervisor | EC | 31AUG16 |
| Authorized Representative | JFP | 31AUG16 |

| EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM | | Scale at A3 1 : 30000 |
|--|------------|--------------------------|
| Drawing No. | FIGURE 1.1 | Rev. A |



LEGEND:

| "A1" | WORKS AREA |
|------|------------------------------------|
| | CONTRACT 3201 |
| | CONTRACT 3202 |
| | CONTRACT 3203 |
| | CONTRACT 3204 |
| | CONTRACT 3205 |
| | CONTRACT 3201 / 3202 / 3203 / 3204 |
| | CONTRACT 3206 |

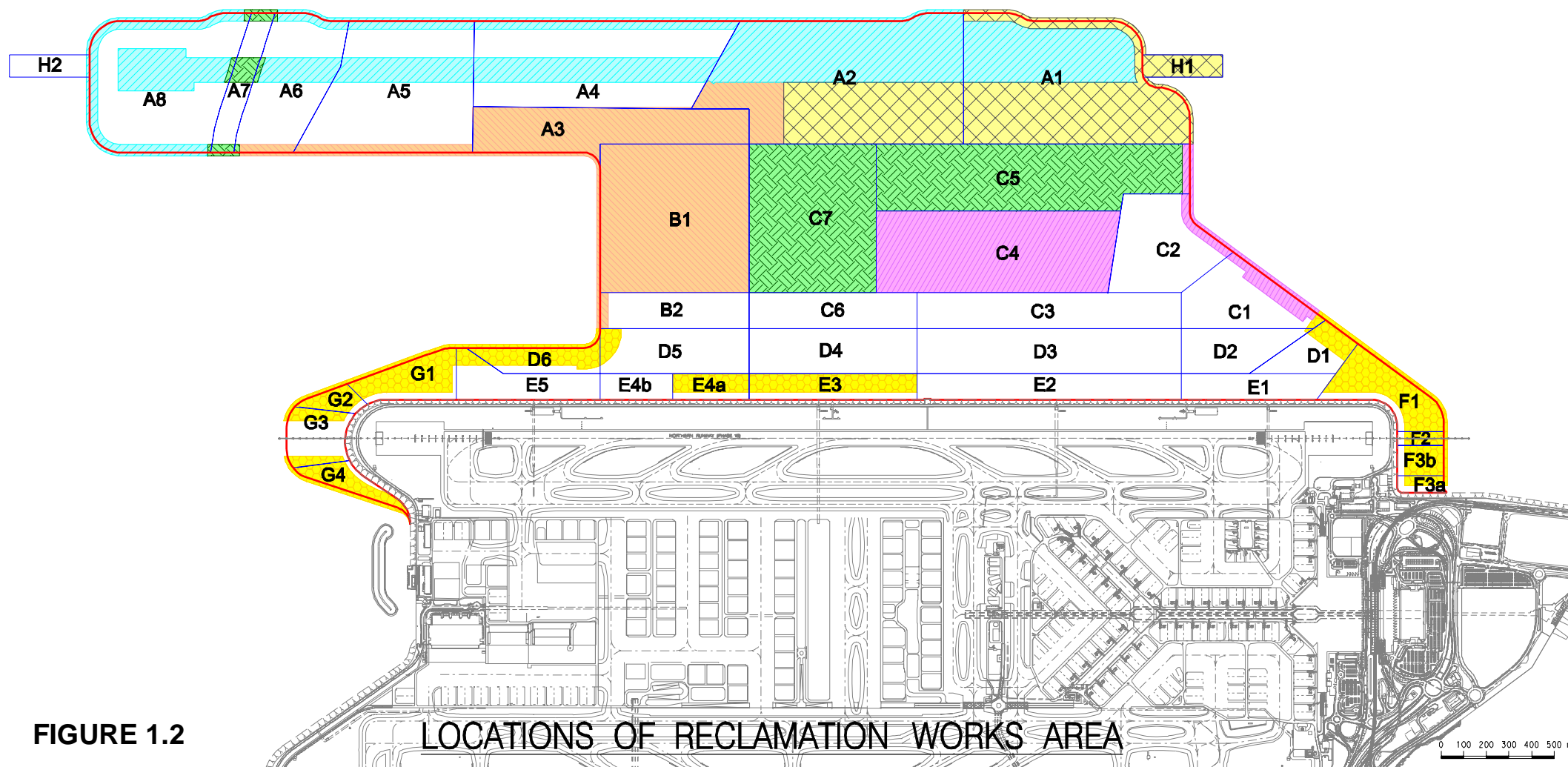
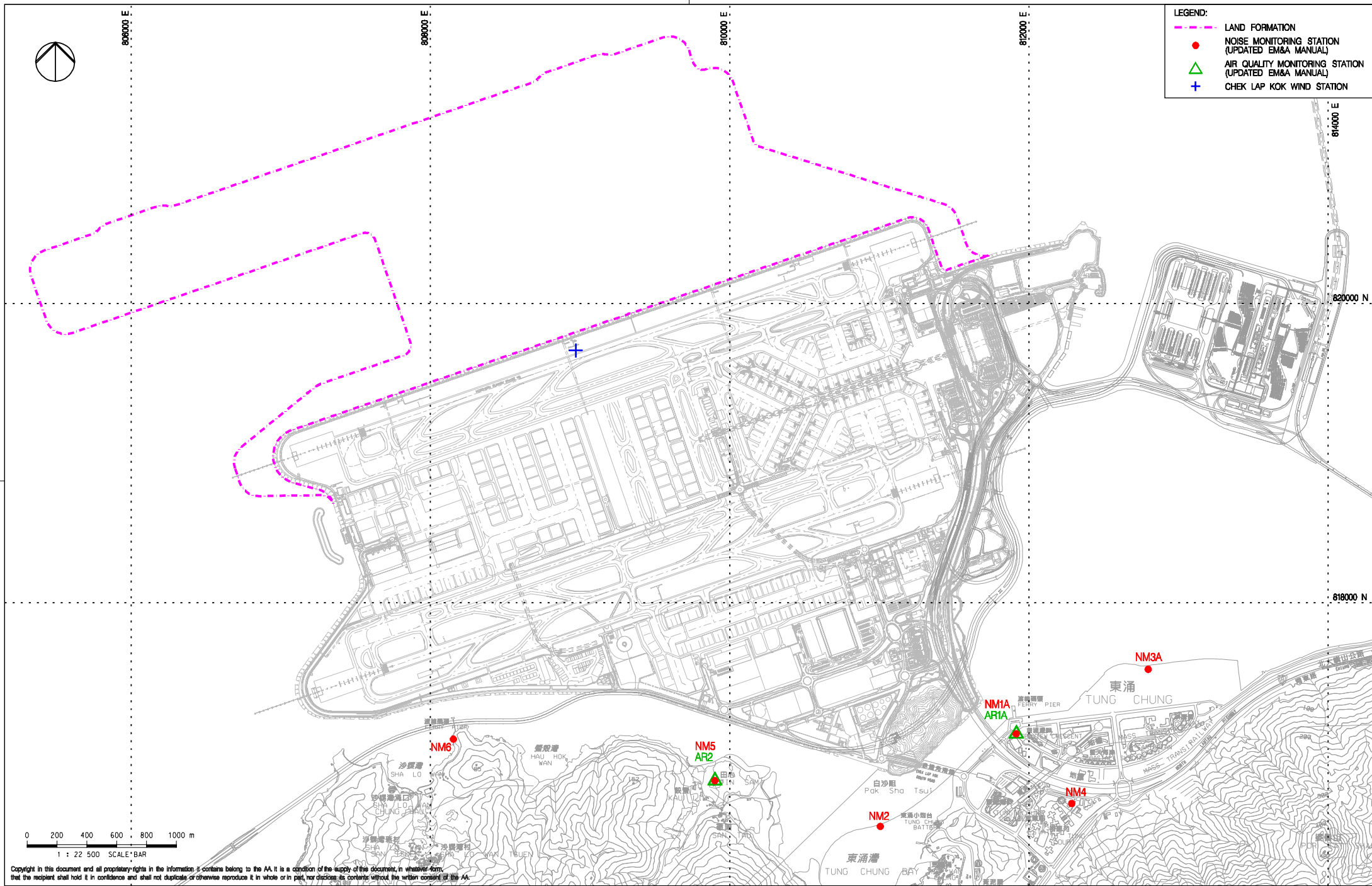


FIGURE 1.2

LOCATIONS OF RECLAMATION WORKS AREA



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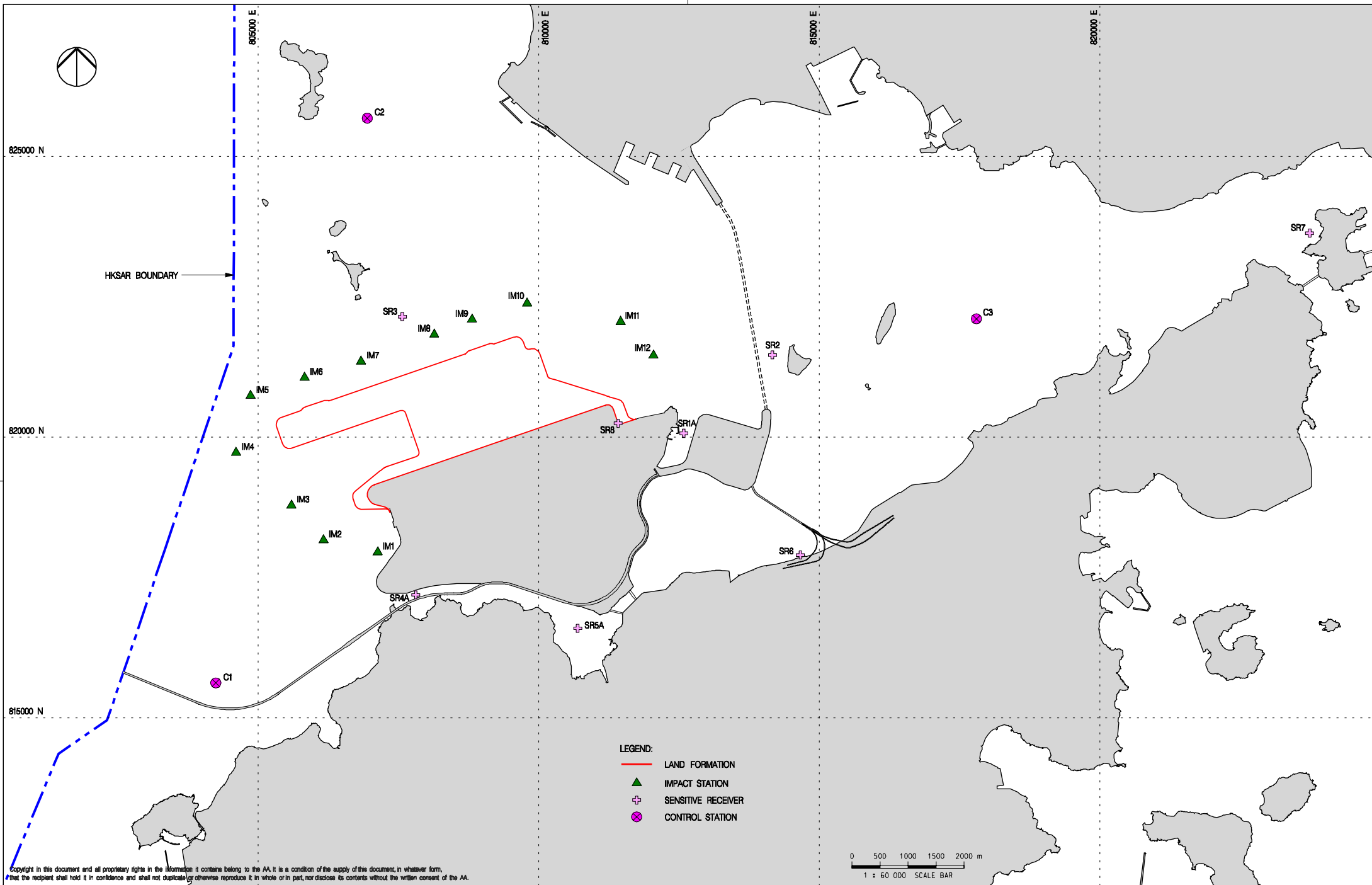
| Rev. | Date | Description | Checked |
|------|---------|------------------|---------|
| A | 06JAN16 | FIRST ISSUE | RO |
| B | 28JAN16 | GENERAL REVISION | RO |
| C | 11FEB16 | GENERAL REVISION | RO |
| D | 28OCT18 | GENERAL REVISION | SH |



LOCATIONS OF AIR AND NOISE MONITORING STATIONS AND CHEK LAP KOK WIND STATION

| Consultant's Signatures for Approval | | Date |
|--------------------------------------|----|---------|
| Design | TK | 28OCT18 |
| Checkers | TK | 28OCT18 |
| Approver | EC | 28OCT18 |

| EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM | | Scale at A3 |
|---|------------|-------------|
| Drawing No. | FIGURE 2.1 | 1:22500 |
| Rev. | D | |



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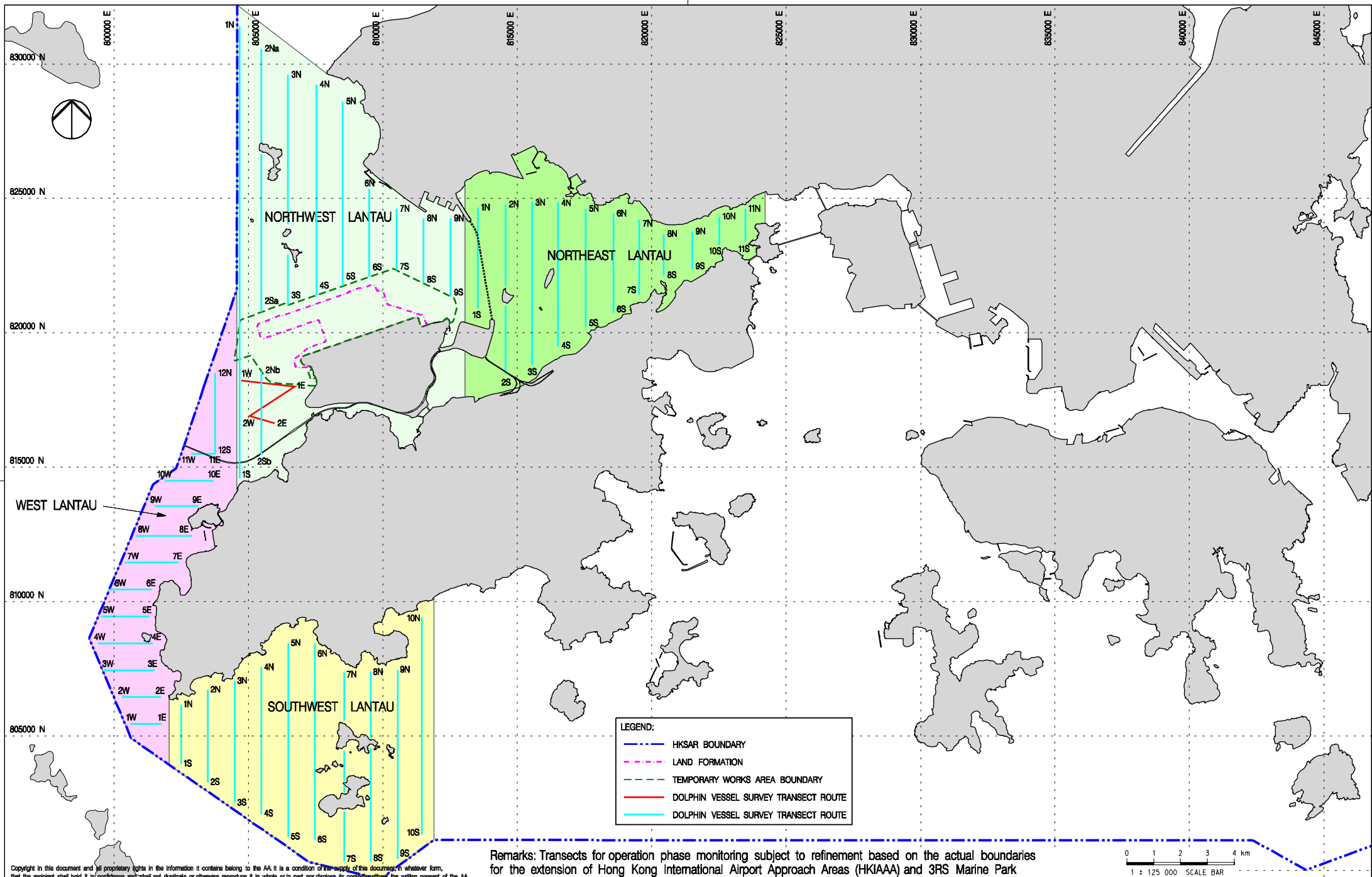
| Rev. | Date | Description | Checked |
|------|---------|------------------|---------|
| A | 25MAY17 | FIRST ISSUE | HY |
| B | 07AUG17 | GENERAL REVISION | JL |
| C | 25MAY18 | GENERAL REVISION | SH |
| D | 29OCT18 | GENERAL REVISION | SH |



| Title |
|-----------------------------------|
| WATER QUALITY MONITORING STATIONS |

| Consultant's Signatures for Approval | | Date |
|--------------------------------------|---------|---------|
| Design | DC | 29OCT18 |
| Checkers | DC / TK | 29OCT18 |
| Approver | EC | 29OCT18 |

| EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM | | Scale at A3 |
|---|------------|-------------|
| Drawing No. | FIGURE 2.2 | 1 : 60000 |
| Rev. | D | |



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Remarks: Transects for operation phase monitoring subject to refinement based on the actual boundaries for the extension of Hong Kong International Airport Approach Areas (HKIAAA) and 3RS Marine Park

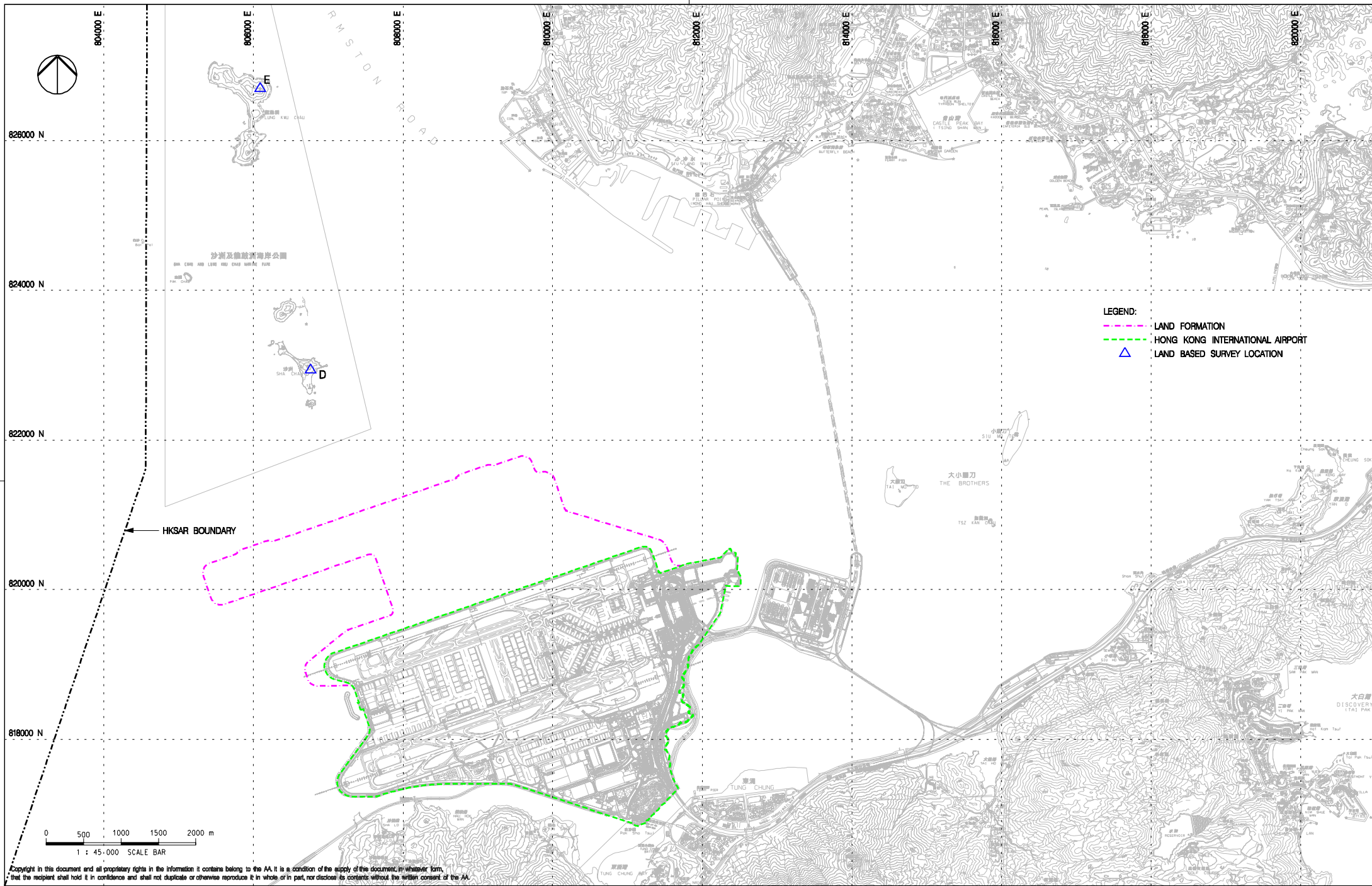
| Rev. | Date | Description | Checked |
|------|---------|------------------|---------|
| A | 02DEC15 | FIRST ISSUE | JC |
| B | 27JUL16 | GENERAL REVISION | JT |
| C | 08FEB17 | GENERAL REVISION | JT |
| D | 01MAR17 | GENERAL REVISION | JT |
| E | 29OCT18 | GENERAL REVISION | SH |



Title
VESSEL BASED DOLPHIN MONITORING
TRANSECTS IN CONSTRUCTION,
POST-CONSTRUCTION AND OPERATION PHASES

| Consultant's Signatures for Approval | | Date |
|--------------------------------------|---------|---------|
| Design | JC | 29OCT18 |
| Checkers | JC / TK | 29OCT18 |
| Approver | EC | 29OCT18 |

| EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM | | Scale at A3 1 : 125000 |
|--|--|---------------------------|
| Drawing No. | | Rev. |
| FIGURE 2.3 | | E |



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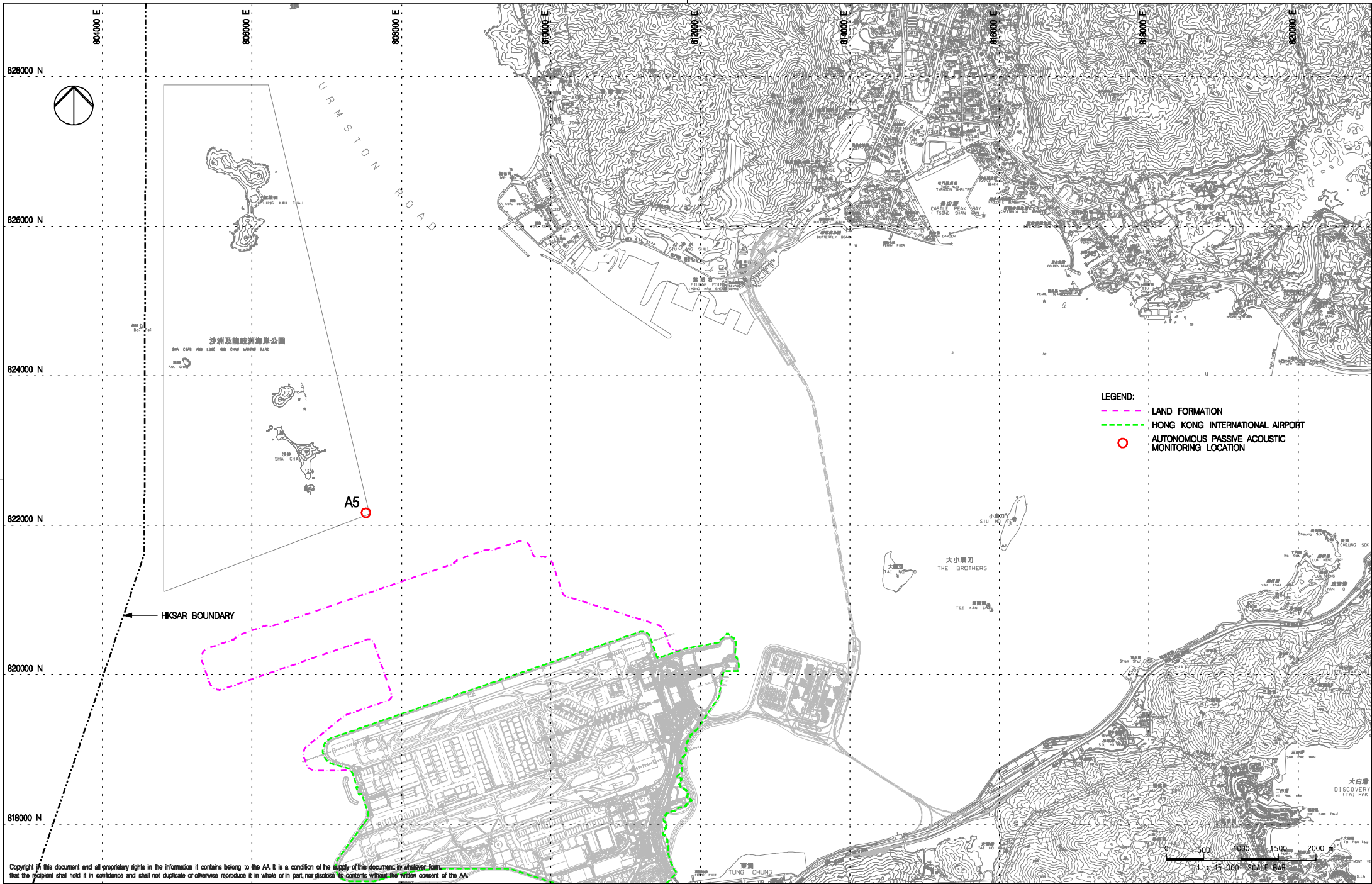
| Rev. | Date | Description | Checked |
|------|---------|------------------|---------|
| A | 02DEC15 | FIRST ISSUE | JC |
| B | 08FEB17 | GENERAL REVISION | JC |
| C | 29OCT18 | GENERAL REVISION | SH |
| | | | |
| | | | |



LAND BASED DOLPHIN MONITORING
IN BASELINE AND CONSTRUCTION PHASES

| Consultant's Signatures for Approval | | Date |
|--------------------------------------|---------|---------|
| Design | JC | 29OCT18 |
| Checkers | JC / TK | 29OCT18 |
| Approver | EC | 29OCT18 |

| EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM | |
|--|--------------------------|
| Drawing No. | Scale at A3 1 : 45000 |
| FIGURE 2.4 | Rev. C |



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| A | 29AUG17 | FIRST ISSUE | JT |
| B | 10OCT17 | GENERAL REVISION | PL |
| C | 29OCT18 | GENERAL REVISION | SH |
| | | | |
| | | | |

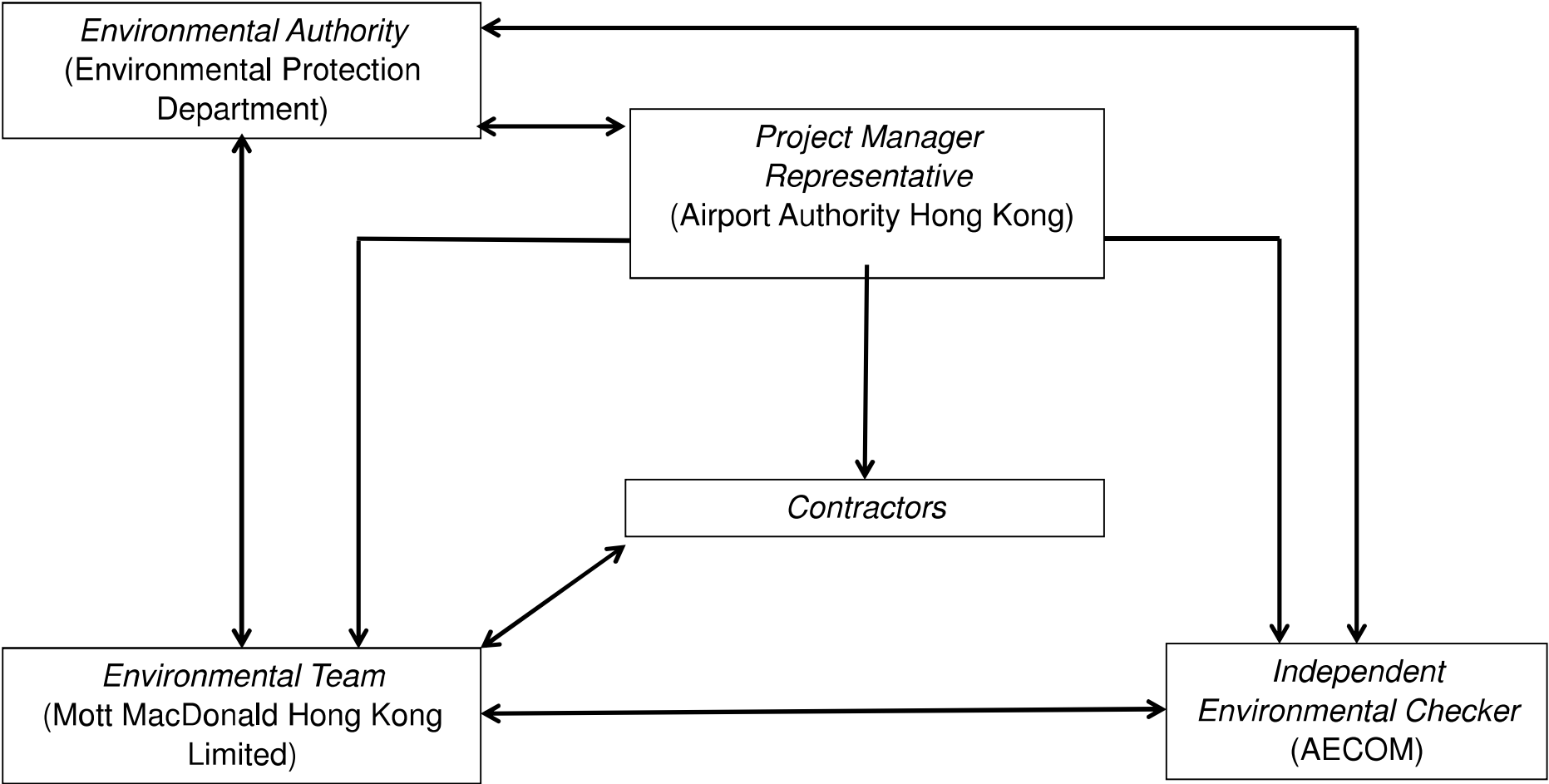


LOCATION FOR AUTONOMOUS PASSIVE ACOUSTIC MONITORING

| Consultant's Signatures for Approval | | Date |
|--------------------------------------|---------|---------|
| Design | JC | 29OCT18 |
| Checkers | JC / TK | 29OCT18 |
| Approver | EC | 29OCT18 |

| EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM | | Scale at A3 |
|---|-------------|-------------|
| Drawing No. | FIGURE 2.10 | 1 : 45000 |
| Rev. | C | |

Appendix A. Project Organization Chart



Appendix B. Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

Appendix B Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|--|-----------|--------------|--|---|-----------------------------------|
| Air Quality Impact – Construction Phase | | | | | |
| 5.2.6.2 | 2.1 | - | Dust Control Measures <ul style="list-style-type: none"> Water spraying for 12 times a day or once every two hours for 24-hour working at all active works area. | Within construction site / Duration of the construction phase | I |
| 5.2.6.3 | 2.1 | - | <ul style="list-style-type: none"> Covering of at least 80% of the stockpiling area by impervious sheets. Water spraying of all dusty materials immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling. | Within construction site / Duration of the construction phase | I |
| 5.2.6.4 | 2.1 | - | Dust control practices as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted. These practices include: Good Site Management <ul style="list-style-type: none"> Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. | Within construction site / Duration of the construction phase | I |
| | | | Disturbed Parts of the Roads <ul style="list-style-type: none"> Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. | Within construction site / Duration of the construction phase | I |
| | | | Exposed Earth <ul style="list-style-type: none"> Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. | Within construction site / Duration of the construction phase | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|----------|-----------|--------------|--|---|-----------------------------------|
| | | | <p>Loading, Unloading or Transfer of Dusty Materials</p> <ul style="list-style-type: none"> All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. | Within construction site / Duration of the construction phase | I |
| | | | <p>Debris Handling</p> <ul style="list-style-type: none"> Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides; and Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. | Within construction site / Duration of the construction phase | I |
| | | | <p>Transport of Dusty Materials</p> <ul style="list-style-type: none"> Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. | Within construction site / Duration of the construction phase | I |
| | | | <p>Wheel washing</p> <ul style="list-style-type: none"> Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. | Within construction site / Duration of the construction phase | I |
| | | | <p>Use of vehicles</p> <ul style="list-style-type: none"> The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site; Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels; and Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. | Within construction site / Duration of the construction phase | I |
| | | | <p>Site hoarding</p> <ul style="list-style-type: none"> Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. | Within construction site / Duration of the construction phase | I |
| 5.2.6.5 | 2.1 | - | <p>Best Practices for Concrete Batching Plant</p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2 as well as in the future Specified Process licence should be adopted. The best practices are recommended to be applied to both the land based and floating concrete batching plants. Best practices include:</p> <p>Cement and other dusty materials</p> | Within Concrete Batching Plant / Duration of the construction phase | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|----------|-----------|--------------|---|---|-----------------------------------|
| | | | <ul style="list-style-type: none"> ▪ The loading, unloading, handling, transfer or storage of cement, pulverised fuel ash (PFA) and/or other equally dusty materials shall be carried in a totally enclosed system acceptable to EPD. All dust-laden air or waste gas generated by the process operations shall be properly extracted and vented to fabric filtering system to meet the required emission limit; ▪ Cement, PFA and/or other equally dusty materials shall be stored in storage silo fitted with audible high level alarms to warn of over-filling. The high-level alarm indicators shall be interlocked with the material filling line such that in the event of the silo approaching an overfilling condition, an audible alarm will operate, and after 1 minute or less the material filling line will be closed; ▪ Vents of all silos shall be fitted with fabric filtering system to meet the required emission limit; ▪ Vents of cement/PFA weighing scale shall be fitted with fabric filtering system to meet the required emission limit; and ▪ Seating of pressure relief valves of all silos shall be checked, and the valves re-seated if necessary, before each delivery. | | |
| | | | <p>Other raw materials</p> <ul style="list-style-type: none"> ▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rock, sand, stone aggregate, shall be carried out in such a manner to prevent or minimize dust emissions; ▪ The materials shall be adequately wetted prior to and during the loading, unloading and handling operations. Manual or automatic water spraying system shall be provided at all unloading areas, stock piles and material discharge points; ▪ All receiving hoppers for unloading relevant materials shall be enclosed on three sides up to 3 m above the unloading point. In no case shall these hoppers be used as the material storage devices; ▪ The belt conveyor for handling materials shall be enclosed on top and two sides with a metal board at the bottom to eliminate any dust emission due to wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can achieve same performance; ▪ All conveyor transfer points shall be totally enclosed. Openings for the passage of conveyors shall be fitted with adequate flexible seals; ▪ Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface; ▪ Conveyors discharged to stockpiles of relevant materials shall be arranged to minimize free fall as far as practicable. All free falling transfer points from conveyors to stockpiles shall be enclosed with chute(s) and water sprayed; ▪ Aggregates with a nominal size less than or equal to 5 mm should be stored in totally enclosed structure such as storage bin and should not be handled in open area. Where there is sufficient buffer area surrounding the concrete batching plant, ground stockpiling may be used; | Within Concrete Batching Plant / Duration of the construction phase | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|----------|-----------|--------------|---|---|-----------------------------------|
| | | | <ul style="list-style-type: none"> The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side; Aggregates with a nominal size greater than 5 mm should preferably be stored in a totally enclosed structure. If open stockpiling is used, the stockpile shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; and The opening between the storage bin and weighing scale of the materials shall be fully enclosed. | | |
| | | | <p>Loading of materials for batching</p> <ul style="list-style-type: none"> Concrete truck shall be loaded in such a way as to minimise airborne dust emissions. The following control measures shall be implemented: <ol style="list-style-type: none"> Pre-mixing the materials in a totally enclosed concrete mixer before loading the materials into the concrete truck is recommended. All dust-laden air generated by the pre-mixing process as well as the loading process shall be totally vented to fabric filtering system to meet the required emission limit; and If truck mixing batching or other types of batching method is used, effective dust control measures acceptable to EPD shall be adopted. The dust control measures must have been demonstrated to EPD that they are capable to collect and vent all dust-laden air generated by the material loading/mixing to dust arrestment plant to meet the required emission limit. The loading bay shall be totally enclosed during the loading process. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | <p>Vehicles</p> <ul style="list-style-type: none"> All practicable measures shall be taken to prevent or minimize the dust emission caused by vehicle movement; and All access and route roads within the premises shall be paved and adequately wetted. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | <p>Housekeeping</p> <ul style="list-style-type: none"> A high standard of housekeeping shall be maintained. All spillages or deposits of materials on ground, support structures or roofs shall be cleaned up promptly by a cleaning method acceptable to EPD. Any dumping of materials at open area shall be prohibited. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| 5.2.6.6 | 2.1 | - | <p>Best Practices for Asphaltic Concrete Plant</p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Tar and Bitumen Works (Asphaltic Concrete Plant) BPM 15 (94) as well as in the future Specified Process licence should be adopted. These include:</p> <p>Design of Chimney</p> <ul style="list-style-type: none"> The chimney shall not be less than 3 metres plus the building height or 8 metres above ground level, whichever is the greater; The efflux velocity of gases from the main chimney shall not be less than 12 m/s at full load condition; | Within Concrete Batching Plant / Duration of the construction phase | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|----------|-----------|--------------|--|--|-----------------------------------|
| | | | <ul style="list-style-type: none"> The flue gas exit temperature shall not be less than the acid dew point; and Release of the chimney shall be directed vertically upwards and not be restricted or deflected. | | |
| | | | <p>Cold feed side</p> <ul style="list-style-type: none"> The aggregates with a nominal size less than or equal to 5 mm shall be stored in totally enclosed structure such as storage bin and shall not be handled in open area; Where there is sufficient buffer area surrounding the plant, ground stockpiling may be used. The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side. If these aggregates are stored above the feeding hopper, they shall be enclosed at least on top and three sides and be wetted on the surface to prevent wind-whipping; The aggregates with a nominal size greater than 5 mm should preferably be stored in totally enclosed structure. Aggregates stockpile that is above the feeding hopper shall be enclosed at least on top and three sides. If open stockpiling is used, the stockpiles shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; Belt conveyors shall be enclosed on top and two sides and provided with a metal board at the bottom to eliminate any dust emission due to the wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can be achieve the same performance; Scrapers shall be provided at the turning points of all belt conveyors inside the chute of the transfer points to remove dust adhered to the belt surface; All conveyor transfer points shall be totally enclosed. Openings for the passages of conveyors shall be fitted with adequate flexible seals; and All materials returned from dust collection system shall be transferred in enclosed system and shall be stored inside bins or enclosures. | <p>Within Concrete Batching Plant / Duration of the construction phase</p> | N/A |
| | | | <p>Hot feed side</p> <ul style="list-style-type: none"> The inlet and outlet of the rotary dryer shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter. The particulate and gaseous concentration at the exhaust outlet of the dust collector shall not exceed the required limiting values; The bucket elevator shall be totally enclosed and the air be extracted and ducted to a dust collection system to meet the required particulates limiting value; All vibratory screens shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings; Chutes for carrying hot material shall be rigid and preferably fitted with abrasion resistant plate inside. They shall be inspected daily for leakages; | <p>Within Concrete Batching Plant / Duration of the construction phase</p> | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|----------|-----------|--------------|---|---|-----------------------------------|
| | | | <ul style="list-style-type: none"> All hot bins shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings. The air shall be extracted and ducted to a dust collection system to meet the required particulates limiting value; and Appropriate control measures shall be adopted in order to meet the required bitumen emission limit as well as the ambient odour level (2 odour units). | | |
| | | | <p>Material transportation</p> <ul style="list-style-type: none"> The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rocks, sands, stone aggregates, reject fines, shall be carried out in such a manner as to minimize dust emissions; Roadways from the entrance of the plant to the product loading points and/or any other working areas where there are regular movements of vehicles shall be paved or hard surfaced; and Haul roads inside the Works shall be adequately wetted with water and/or chemical suppressants by water trucks or water sprayers. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | <p>Control of emissions from bitumen decanting</p> <ul style="list-style-type: none"> The heating temperature of the particular bitumen type and grade shall not exceed the corresponding temperature limit of the same type listed in Appendix 1 of the Guidance Note; Tamper-free high temperature cut-off device shall be provided to shut off the fuel supply or electricity in case the upper limit for bitumen temperature is reached; Proper chimney for the discharge of bitumen fumes shall be provided at high level; The emission of bitumen fumes shall not exceed the required emission limit; and <p>The air-to-fuel ratio shall be properly controlled to allow complete combustion of the fuel. The fuel burners, if any, shall be maintained properly and free from carbon deposits in the burner nozzles.</p> | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | <p>Liquid fuel</p> <ul style="list-style-type: none"> The receipt, handling and storage of liquid fuel shall be carried out so as to prevent the release of emissions of organic vapours and/or other noxious and offensive emissions to the air. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | <p>Housekeeping</p> <ul style="list-style-type: none"> A high standard of housekeeping shall be maintained. Waste material, spillage and scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared frequently. The minimum clearing frequency is on a weekly basis. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| 5.2.6.7 | 2.1 | - | <p>Best Practices for Rock Crushing Plants</p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plant) BPM 11/1 (95) as well as in the future Specified Process licence should be adopted. These include:</p> | Within Concrete Batching Plant / Duration of the construction phase | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <p>Crushers</p> <ul style="list-style-type: none"> The outlet of all primary crushers, and both inlet and outlet of all secondary and tertiary crushers, if not installed inside a reasonably dust tight housing, shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter; The inlet hopper of the primary crushers shall be enclosed on top and 3 sides to contain the emissions during dumping of rocks from trucks. The rock while still on the trucks shall be wetted before dumping; Water sprayers shall be installed and operated in strategic locations at the feeding inlet of crushers; and Crusher enclosures shall be rigid and be fitted with self-closing doors and close-fitting entrances and exits. Where conveyors pass through the crusher enclosures, flexible covers shall be installed at entries and exits of the conveyors to the enclosure. | | |
| | | | <p>Vibratory screens and grizzlies</p> <ul style="list-style-type: none"> All vibratory screens shall be totally enclosed in a housing. Screenhouses shall be rigid and reasonably dust tight with self-closing doors or close-fitted entrances and exits for access. Where conveyors pass through the screenhouse, flexible covers shall be installed at entries and exits of the conveyors to the housing. Where containment of dust within the screenhouse structure is not successful then a dust extraction and collection system shall be provided; and All grizzlies shall be enclosed on top and 3 sides and sufficient water sprayers shall be installed at their feeding and outlet areas. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | <p>Belt conveyors</p> <ul style="list-style-type: none"> Except for those conveyors which are placed within a totally enclosed structure such as a screenhouse or those erected at the ground level, all conveyors shall be totally enclosed with windshield on top and 2 sides; Effective belt scraper such as the pre-cleaner blades made by hard wearing materials and provided with pneumatic tensioner, or equivalent device, shall be installed at the head pulley of designated conveyor as required to dislodge fine dust particles that may adhere to the belt surface and to reduce carry-back of fine materials on the return belt. Bottom plates shall also be provided for the conveyor unless it has been demonstrated that the corresponding belt scraper is effective and well maintained to prevent falling material from the return belt; and Except for those transfer points which are placed within a totally enclosed structure such as a screenhouse, all transfer points to and from conveyors shall be enclosed. Where containment of dust within the enclosure is not successful, then water sprayers shall be provided. Openings for any enclosed structure for the passage of conveyors shall be fitted with flexible seals. | Within Concrete Batching Plant / Duration of the construction phase | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | Storage piles and bins <ul style="list-style-type: none"> Where practicable, free falling transfer points from conveyors to stockpiles shall be fitted with flexible curtains or be enclosed with chutes designed to minimize the drop height. Water sprays shall also be used where required. The surface of all surge piles and stockpiles of blasted rocks or aggregates shall be kept sufficiently wet by water spraying wherever practicable; All open stockpiles for aggregates of size in excess of 5 mm shall be kept sufficiently wet by water spraying where practicable; or The stockpiles of aggregates 5 mm in size or less shall be enclosed on 3 sides or suitably located to minimize wind-whipping. Save for fluctuations in stock or production, the average stockpile shall stay within the enclosure walls and in no case the height of the stockpile shall exceed twice the height of the enclosure walls. Scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared regularly. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| | | | Rock drilling equipment <ul style="list-style-type: none"> Appropriate dust control equipment such as a dust extraction and collection system shall be used during rock drilling activities. | Within Concrete Batching Plant / Duration of the construction phase | N/A |
| Hazard to Human Life – Construction Phase | | | | | |
| Table 6.40 | 3.2 | - | <ul style="list-style-type: none"> Precautionary measures should be established to request barges to move away during typhoons. | Construction Site / Construction Period | I |
| Table 6.40 | 3.2 | - | <ul style="list-style-type: none"> An appropriate marine traffic management system should be established to minimize risk of ship collision. | Construction Site / Construction Period | I |
| Table 6.40 | 3.2 | - | <ul style="list-style-type: none"> Location of all existing hydrant networks should be clearly identified prior to any construction works. | Construction Site / Construction Period | I |
| Noise Impact – Construction Phase | | | | | |
| 7.5.6 | 4.3 | - | Good Site Practice Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: <ul style="list-style-type: none"> only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum; | Within the Project site / During construction phase / Prior to commencement of operation | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <ul style="list-style-type: none"> plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; mobile plant should be sited as far away from NSRs as possible; and material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities. | | |
| 7.5.6 | 4.3 | - | Adoption of QPME <ul style="list-style-type: none"> QPME should be adopted as far as applicable. | Within the Project site / During construction phase / Prior to commencement of operation | I |
| 7.5.6 | 4.3 | - | Use of Movable Noise Barriers <ul style="list-style-type: none"> Movable noise barriers should be placed along the active works area and mobile plants to block the direct line of sight between PME and the NSRs. | Within the Project site / During construction phase / Prior to commencement of operation | I |
| 7.5.6 | 4.3 | - | Use of Noise Enclosure/ Acoustic Shed <ul style="list-style-type: none"> Noise enclosure or acoustic shed should be used to cover stationary PME such as air compressor and generator. | Within the Project site / During construction phase / Prior to commencement of operation | I |
| Water Quality Impact – Construction Phase | | | | | |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| 8.8.1.2 and 8.8.1.3 | 5.1 | 2.26 | Marine Construction Activities <u>General Measures to be Applied to All Works Areas</u> <ul style="list-style-type: none"> ▪ Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; ▪ Use of Lean Material Overboard (LMOB) systems shall be prohibited; ▪ Excess materials shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessels are moved; ▪ Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; ▪ Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; ▪ All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ▪ The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site; and ▪ For ground improvement activities including DCM, the wash water from cleaning of the drilling shaft should be appropriately treated before discharge. The Contractor should ensure the waste water meets the WPCO/TM requirements before discharge. No direct discharge of contaminated water is permitted. | Within construction site / Duration of the construction phase | I |
| | | | <u>Specific Measures to be Applied to All Works Areas</u> <ul style="list-style-type: none"> ▪ The daily maximum production rates shall not exceed those assumed in the water quality assessment in the EIA report; ▪ A maximum of 10 % fines content to be adopted for sand blanket and 20 % fines content for marine filling below +2.5 mPD prior to substantial completion of seawall (until end of Year 2017) shall be specified in the works contract document; | Within construction site / Duration of the construction phase | I |
| | | | <ul style="list-style-type: none"> ▪ An advance seawall of at least 200m to be constructed (comprising either rows of contiguous permanent steel cells completed above high tide mark or partially completed seawalls with rock core to high tide mark and filter layer on the inner side) prior to commencement of marine filling activities; | | I |
| | | | <ul style="list-style-type: none"> ▪ Closed grab dredger shall be used to excavate marine sediment; ▪ Silt curtains surrounding the closed grab dredger shall be deployed in accordance with the Silt Curtain Deployment Plan; and | | N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan) |
| | | | <ul style="list-style-type: none"> ▪ The Silt Curtain Deployment Plan shall be implemented. | | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <u>Specific Measures to be Applied to Land Formation Activities prior to Commencement of Marine Filling Works</u> <ul style="list-style-type: none"> Double layer 'Type III' silt curtains to be applied around the active eastern works areas prior to commencement of sand blanket laying activities. The silt curtains shall be configured to minimise SS release during ebb tides. A silt curtain efficiency test shall be conducted to validate the performance of the silt curtains; | Within construction site / Duration of the construction phase | NA *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan) |
| | | | <ul style="list-style-type: none"> Double layer silt curtains to enclose WSRs C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of construction; and | | For C7a, I For C8, I *(The requirement of silt curtain / screen has been modified. The details can be referred to Silt Curtain Deployment Plan) |
| | | | <ul style="list-style-type: none"> The silt curtains and silt screens should be regularly checked and maintained. | | I |
| | | | <u>Specific Measures to be Applied to Land Formation Activities during Marine Filling Works</u> <ul style="list-style-type: none"> Double layer 'Type II' or 'Type III' silt curtains to be applied around the eastern openings between partially completed seawalls prior to commencement of marine filling activities. The silt curtains shall be configured to minimise SS release during ebb tides; | Within construction site / Duration of the construction phase | I *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan) |
| | | | <ul style="list-style-type: none"> Double layer silt curtains to be applied at the south-western opening prior to commencement of marine filling activities; | | N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan) |
| | | | <ul style="list-style-type: none"> Double layer silt curtain to enclose WSR C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of marine filling activities; and | | N/A *(The requirement of silt curtain / screen has been modified. The details can be referred to Silt Curtain Deployment Plan) |
| | | | <ul style="list-style-type: none"> The silt curtains and silt screens should be regularly checked and maintained. | | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <u>Specific Measures to be Applied to the Field Joint Excavation Works for the Submarine Cable Diversion</u> <ul style="list-style-type: none"> Only closed grabs designed and maintained to avoid spillage shall be used and should seal tightly when operated. Excavated materials shall be disposed at designated marine disposal area in accordance with the Dumping at Sea Ordinance (DASO) permit conditions; and Silt curtains surrounding the closed grab dredger to be deployed as a precautionary measure. | Within construction site / Duration of the construction phase | N/A |
| 8.8.1.4 | 5.1 | - | Modification of the Existing Seawall <ul style="list-style-type: none"> Silt curtains shall be deployed around the seawall modification activities to completely enclose the active works areas, and care should be taken to avoid splashing of rockfill / rock armour into the surrounding marine environment. For the connecting sections with the existing outfalls, works for these connection areas should be undertaken during the dry season in order that individual drainage culvert cells may be isolated for interconnection works. | At the existing northern seawall / Duration of the construction phase | N/A |
| 8.8.1.5 | 5.1 | - | Construction of New Stormwater Outfalls and Modifications to Existing Outfalls <ul style="list-style-type: none"> During operation of the temporary drainage channel, runoff control measures such as bunding or silt fence shall be provided on both sides of the channel to prevent accumulation and release of SS via the temporary channel. Measures should also be taken to minimise the ingress of site drainage into the culvert excavations. | Within construction site / Duration of the construction phase | N/A |
| 8.8.1.6 8.8.1.7 | 5.1 | 2.27 | Piling Activities for Construction of New Runway Approach Lights and HKIAAA Marker Beacons <p>Silt curtains shall be deployed around the piling activities to completely enclose the piling works and care should be taken to avoid spillage of excavated materials into the surrounding marine environment.</p> <p><u>For construction of the eastern approach lights at the CMPs</u></p> <ul style="list-style-type: none"> Ground improvement via DCM using a close-spaced layout shall be completed prior to commencement of piling works; Steel casings shall be installed to enclose the excavation area prior to commencement of excavation; The excavated materials shall be removed using a closed grab within the steel casings; No discharge of the cement mixed materials into the marine environment will be allowed; and Excavated materials shall be treated and reused on-site. | Within construction site / Duration of the construction phase | N/A |
| 8.8.1.8 | 5.1 | - | Construction of Site Runoff and Drainage <p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended:</p> <ul style="list-style-type: none"> Install perimeter cut-off drains to direct off-site water around the site and implement internal drainage, erosion and sedimentation control facilities. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site | Within construction site / Duration of the construction phase | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <p>drainage system should be undertaken by the Contractors prior to the commencement of construction (for works areas located on the existing Airport island) or as soon as the new land is completed (for works areas located on the new landform);</p> <hr/> <ul style="list-style-type: none"> Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM-DSS standards under the WPCO. The design of efficient silt removal facilities should make reference to the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractors prior to the commencement of construction; <hr/> <ul style="list-style-type: none"> All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly; <hr/> <ul style="list-style-type: none"> Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities; <hr/> <ul style="list-style-type: none"> In the event that contaminated groundwater is identified at excavation areas, this should be treated on-site using a suitable wastewater treatment process. The effluent should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge to foul sewers or collected for proper disposal off-site. No direct discharge of contaminated groundwater is permitted; and <hr/> <ul style="list-style-type: none"> All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exits. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. All washwater should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge. | | <p>I</p> <hr/> <p>I</p> <hr/> <p>I</p> <hr/> <p>N/A</p> <hr/> <p>I</p> |
| 8.8.1.9 | 5.1 | - | <p>Sewage Effluent from Construction Workforce</p> <ul style="list-style-type: none"> Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. | Within construction site / During construction phase | I |
| 8.8.1.10 8.8.1.11 | 5.1 | | <p>General Construction Activities</p> <ul style="list-style-type: none"> Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used; and | Within construction site / During construction phase | I |

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| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <ul style="list-style-type: none"> For the marine sediments expected to be excavated from the piling works of TRC, APM & BHS tunnels, airside tunnels and other facilities on the proposed land formation area, piling work of marine sections of the approach lights and HKIAAA beacons, basement works for some of T2 expansion area and excavation works for the proposed APM depot should be treated and reused on-site as backfilling materials, although required treatment level / detail and the specific re-use mode are under development. | | N/A |
| 10.5.1.1 | 7.1 | - | <p>The following good site practices should be performed during the construction activities include:</p> <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; Training of site personnel in proper waste management and chemical waste handling procedures; Provision of sufficient waste disposal points and regular collection for disposal; Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks by tarpaulin/ similar material or by transporting wastes in enclosed containers. The cover should be extended over the edges of the sides and tailboards; Stockpiles of C&D materials should be kept wet or covered by impervious sheets to avoid wind-blown dust; All dusty materials including C&D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the barging points/ stockpile areas; C&D materials to be delivered to and from the project site by barges or by trucks should be kept wet or covered to avoid wind-blown dust; The speed of the trucks including dump trucks carrying C&D or waste materials within the site should be controlled to about 10 km/hour in order to reduce the adverse dust impact and secure the safe movement around the site; and To avoid or minimise dust emission during transport of C&D or waste materials within the site, each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials. Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. | Project Site Area / Construction Phase | I |
| 10.5.1.3 | 7.1 | - | <p>The following practices should be performed to achieve waste reduction include:</p> <ul style="list-style-type: none"> Use of steel or aluminium formworks and falseworks for temporary works as far as practicable; Adoption of repetitive design to allow reuse of formworks as far as practicable; Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; | Project Site Area / Construction Phase | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <ul style="list-style-type: none"> Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force; Any unused chemicals or those with remaining functional capacity should be collected for reused as far as practicable; Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. | | |
| 10.5.1.5 | 7.1 | | <ul style="list-style-type: none"> Inert and non-inert C&D materials should be handled and stored separately to avoid mixing the two types of materials. | Project Site Area / Construction Phase | I |
| 10.5.1.5 | 7.1 | - | <ul style="list-style-type: none"> Any recyclable materials should be segregated from the non-inert C&D materials for collection by reputable licensed recyclers whereas the non-recyclable waste materials should be disposed of at the designated landfill site by a reputable licensed waste collector. | Project Site Area / Construction Phase | I |
| 10.5.1.6 | 7.1 | - | <ul style="list-style-type: none"> A trip-ticket system promulgated shall be developed in order to monitor the off-site delivery of surplus inert C&D materials that could not be reused on-site for the proposed land formation work at the PFRF and to control fly tipping. | Project Site Area / Construction Phase | I |
| 10.5.1.6 | 7.1 | 2.32 | <ul style="list-style-type: none"> The Contractor should prepare and implement a Waste Management Plan detailing various waste arising and waste management practices. | Construction Phase | I |
| 10.5.1.16 | 7.1 | - | <p>The following mitigation measures are recommended during excavation and treatment of the sediments:</p> <ul style="list-style-type: none"> On-site remediation should be carried out in an enclosed area in order to minimise odour/dust emissions; | Project Site Area / Construction Phase | N/A |
| | | | <ul style="list-style-type: none"> The loading, unloading, handling, transfer or storage of treated and untreated sediment should be carried out in such a manner to prevent or minimise dust emissions; | | I |
| | | | <ul style="list-style-type: none"> All practical measures, including but not limited to speed control for vehicles, should be taken to minimise dust emission; | | I |
| | | | <ul style="list-style-type: none"> Good housekeeping should be maintained at all times at the sediment treatment facility and storage area; | | I |
| | | | <ul style="list-style-type: none"> Treated and untreated sediment should be clearly separated and stored separately; and | | N/A |
| | | | <ul style="list-style-type: none"> Surface runoff from the enclosed area should be properly collected and stored separately, and then properly treated to levels in compliance with the relevant effluent standards as required by the Water Pollution Control Ordinance before final discharge. | | I |
| 10.5.1.18 | 7.1 | - | <p>The marine sediments to be removed from the cable field joint area would be disposed of at the designated disposal sites to be allocated by the MFC. The following mitigation measures should be strictly</p> | Project Site Area / Construction Phase | N/A |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <p>followed to minimise potential impacts on water quality during transportation of the sediments requiring Type 1 disposal:</p> <ul style="list-style-type: none"> Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material; Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by EPD; and Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation. | | |
| 10.5.1.19 | 7.1 | - | <p>Contractor should register with the EPD as a chemical waste producer and to follow the relevant guidelines. The following measures should be implemented:</p> <ul style="list-style-type: none"> Good quality containers compatible with the chemical wastes should be used; Incompatible chemicals should be stored separately; Appropriate labels must be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc.; and The contractor will use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. | Project Site Area / Construction Phase | I |
| 10.5.1.20 | 7.1 | - | <ul style="list-style-type: none"> General refuse should be stored in enclosed bins or compaction units separated from inert C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site for disposal at designated landfill sites. An enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material. | Project Site Area / Construction Phase | I |
| 10.5.1.21 | 7.1 | - | <ul style="list-style-type: none"> The construction contractors will be required to regularly check and clean any refuse trapped or accumulated along the newly constructed seawall. Such refuse will then be stored and disposed of together with the general refuse. | Project Site Area / Construction Phase | N/A |
| Land Contamination – Construction Phase | | | | | |
| 11.10.1.2 to 11.10.1.3 | 8.1 | 2.32 | <p>For areas inaccessible during site reconnaissance survey</p> <ul style="list-style-type: none"> Further site reconnaissance would be conducted once the areas are accessible in order to identify any land contamination concern for the areas. | Project Site Area inaccessible during site reconnaissance / Prior to Construction Phase | I |
| | | | <ul style="list-style-type: none"> Subject to further site reconnaissance findings, a supplementary Contamination Assessment Plan (CAP) for additional site investigation (SI) (if necessary) may be prepared and submitted to EPD for endorsement prior to the commencement of SI at these areas. | | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
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| | | | <ul style="list-style-type: none"> After completion of SI, the Contamination Assessment Report (CAR) will be prepared and submitted to EPD for approval prior to start of the proposed construction works at the golf course, the underground and above-ground fuel storage tank areas, emergency power generation units, airside petrol filling station and fuel tank room. | | I *(CAR for golf course) |
| | | | <ul style="list-style-type: none"> Should remediation be required, Remediation Action Plan (RAP) and Remediation Report (RR) will be prepared for EPD's approval prior to commencement of the proposed remediation and any construction works respectively. | | N/A |
| 11.8.1.2 | 8.1 | - | <p>If contaminated soil is identified, the following mitigation measures are for the excavation and transportation of contaminated materials (if any):</p> <ul style="list-style-type: none"> To minimize the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when working directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; Stockpiling of contaminated excavated materials on site should be avoided as far as possible; The use of any contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; Vehicles containing any excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; Truck bodies and tailgates should be sealed to prevent any discharge; Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; Speed control for trucks carrying contaminated materials should be exercised. 8km/h is the recommended speed limit; Strictly observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and Maintain records of waste generation and disposal quantities and disposal arrangements. | Project Site Area / Construction Phase | N/A |
| Terrestrial Ecological – Construction Phase | | | | | |
| 12.10.1.1 | 9.2 | 2.14 | <p>Pre-construction Egret Survey</p> <ul style="list-style-type: none"> Conduct ecological survey for Sha Chau egret to update the latest boundary of the egret. | Breeding season (April - July) prior to commencement of HDD drilling works at HKIA | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|--|-----------|--------------|--|---|-----------------------------------|
| 12.7.2.3 and 12.7.2.6 | 9.1 | 2.30 | Avoidance and Minimisation of Direct Impact to Egret <ul style="list-style-type: none"> The daylighting location will avoid direct encroachment to the Sheung Sha Chau egret. The daylighting location and mooring of flat top barge, if required, will be kept away from the egret; In any event, controls such as demarcation of construction site boundary and confining the lighting within the site will be practised to minimise disturbance to off-site habitat at Sheung Sha Chau Island; and The containment pit at the daylighting location shall be covered or camouflaged. | During construction phase at Sheung Sha Chau Island | I |
| 12.7.2.5 | 9.1 | 2.30 | Preservation of Nesting Vegetation <ul style="list-style-type: none"> The proposed daylighting location and the arrangement of connecting pipeline will avoid the need of tree cutting, therefore the trees that are used by ardeids for nesting will be preserved. | During construction phase at Sheung Sha Chau Island | I |
| 12.7.2.4 and 12.7.2.6 | 9.1 | 2.30 | Timing the Pipe Connection Works outside Ardeid's Breeding Season <ul style="list-style-type: none"> All HDD and related construction works on Sheung Sha Chau Island will be scheduled outside the ardeids' breeding season (between April and July). No night-time construction work will be allowed on Sheung Sha Chau Island during all seasons. | During construction phase at Sheung Sha Chau Island | I |
| 12.10.1.1 | 9.3 | - | Ecological Monitoring <ul style="list-style-type: none"> During the HDD construction works period from August to March, ecological monitoring will be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found. | at Sheung Sha Chau Island | I |
| Marine Ecological Impact – Pre-construction Phase | | | | | |
| 13.11.4.1 | 10.2.2 | - | <ul style="list-style-type: none"> Pre-construction phase Coral Dive Survey. | HKIAAA artificial seawall | I |
| Marine Ecological Impact – Construction Phase | | | | | |
| 13.11.1.3 to 13.11.1.6 | - | - | Minimisation of Land Formation Area <ul style="list-style-type: none"> Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population. | Land formation footprint / during detailed design phase to completion of construction | I |
| 13.11.1.7 to 13.11.1.10 | - | 2.31 | Use of Construction Methods with Minimal Risk/Disturbance <ul style="list-style-type: none"> Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF; Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on CWDs, fisheries and the marine environment; | During construction phase at marine works area | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|------------------------|-----------|--------------|--|---|-----------------------------------|
| | | | <ul style="list-style-type: none"> Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; | | N/A |
| | | | <ul style="list-style-type: none"> Avoid bored piling during CWD peak calving season (Mar to Jun); | | I |
| | | | <ul style="list-style-type: none"> Prohibition of underwater percussive piling; and | | I |
| | | | <ul style="list-style-type: none"> Use of horizontal directional drilling (HDD) method and water jetting methods for placement of submarine cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources. | | I |
| 13.11.2.1 to 13.11.2.7 | - | - | Mitigation for Indirect Disturbance due to Deterioration of Water Quality <ul style="list-style-type: none"> Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices; | All works area during the construction phase | I |
| | | | <ul style="list-style-type: none"> Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains); | | I |
| | | | <ul style="list-style-type: none"> Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and | | N/A |
| | | | Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources. | | I |
| 13.11.1.12 | - | - | Strict Enforcement of No-Dumping Policy <ul style="list-style-type: none"> A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area; Mandatory educational programme of the no-dumping policy be made available to all construction site personnel for all project-related works; Fines for infractions should be implemented; and Unscheduled, on-site audits shall be implemented. | All works area during the construction phase | I |
| 13.11.1.13 | - | - | Good Construction Site Practices <ul style="list-style-type: none"> Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines; Keep the number of working or stationary vessels present on-site to the minimum anytime; and Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators. | All works area during the construction phase | I |
| 13.11.1.3 to 13.11.1.6 | - | - | Minimisation of Land Formation Area <ul style="list-style-type: none"> Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population. | Land formation footprint / during detailed design phase | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|--------------------------|-----------|--------------|---|--|-----------------------------------|
| | | | | to completion of construction | |
| 13.11.5.4 to 13.11.5.13 | 10.3.1 | - | SkyPier High Speed Ferries' Speed Restrictions and Route Diversions <ul style="list-style-type: none"> SkyPier HSFs operating to / from Zhuhai and Macau would divert north of SCLKC Marine Park with a 15 knot speed limit to apply for the part-journeys that cross high CWD abundance grid squares as indicatively shown in Drawing No. MCL/P132/EIA/13-023 of the EIA Report. Both the alignment of the northerly route and the portion of routings to be subject to the speed limit of 15 knots shall be finalised prior to commencement of construction based on the future review of up-to-date CWD abundance and EM&A data and taking reference to changes in total SkyPier HSF numbers; and A maximum of 10 knots will be enforced through the designated SCLKC Marine Park area at all times. | Area between the footprint and SCLKC Marine Park during construction phase | I |
| | | | Other mitigation measures <ul style="list-style-type: none"> The ET will audit various parameters including actual daily numbers of HSFs, compliance with the 15-knot speed limit in the speed control zone and diversion compliance for SkyPier HSFs operating to / from Zhuhai and Macau; and The effectiveness of the CWD mitigation measures after implementation of initial six month SkyPier HSF diversion and speed restriction will be reviewed. | Area between the footprint and SCLKC Marine Park during construction phase | I |
| 13.11.5.14 to 13.11.5.18 | 10.3.1 | 2.31 | Dolphin Exclusion Zone <ul style="list-style-type: none"> Establishment of a 24 hr Dolphin Exclusion Zone (DEZ) with a 250 m radius around the land formation works areas; | Marine waters around land formation works area during construction phase | I |
| | | | <ul style="list-style-type: none"> A DEZ would also be implemented during ground improvement works (e.g. DCM), water jetting works for submarine cables diversion, open trench dredging at the field joint locations and seawall construction; and | | I |
| | | | <ul style="list-style-type: none"> A DEZ would also be implemented during bored piling work but as a precautionary measure only. | | N/A |
| 13.11.5.19 | 10.4 | 2.31 | Acoustic Decoupling of Construction Equipment <ul style="list-style-type: none"> Air compressors and other noisy equipment that must be mounted on steel barges should be acoustically-decoupled to the greatest extent feasible, for instance by using rubber or air-filled tyres; and Specific acoustic decoupling measures shall be specified during the detailed design of the project for use during the land formation works. | Around coastal works area during construction phase | I |
| 13.11.5.20 | 10.6.1 | 2.29 | Spill Response Plan <ul style="list-style-type: none"> An oil and hazardous chemical spill response plan is proposed to be established during the construction phase as a precautionary measure so that appropriate actions to prevent or reduce risks to CWDs can be undertaken in the event of an accidental spillage. | Construction phase | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|--|-----------|--------------|--|---|-----------------------------------|
| 13.11.5.21 to 13.11.5.23 | 10.6.1 | - | Construction Vessel Speed Limits and Skipper Training <ul style="list-style-type: none"> A speed limit of 10 knots should be strictly observed for construction vessels at areas with the highest CWD densities; and Vessels traversing through the work areas should be required to use predefined and regular routes (which would presumably become known to resident dolphins) to reduce disturbance to cetaceans due to vessel movements. Specific marine routes shall be specified by the Contractor prior to construction commencing. | All areas north and west of Lantau Island during construction phase | I |
| Fisheries Impact – Construction Phase | | | | | |
| 14.9.1.2 to 14.9.1.5 | - | - | Minimisation of Land Formation Area <ul style="list-style-type: none"> Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for fisheries resources. | Land formation footprint / during detailed design phase to completion of construction | I |
| 14.9.1.6 | - | - | Use of Construction Methods with Minimal Risk/Disturbance <ul style="list-style-type: none"> Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF; | During construction phase at marine works area | I |
| | | | <ul style="list-style-type: none"> Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on fisheries and the marine environment; | | I |
| | | | <ul style="list-style-type: none"> Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and | | N/A |
| | | | <ul style="list-style-type: none"> Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources. | | I |
| 14.9.1.11 | - | - | Strict Enforcement of No-Dumping Policy <ul style="list-style-type: none"> A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area; Mandatory educational programme of the no-dumping policy be made available to all construction site personnel for all project-related works; Fines for infractions should be implemented; and Unscheduled, on-site audits shall be implemented. | All works area during the construction phase | I |
| 14.9.1.12 | - | - | Good Construction Site Practices <ul style="list-style-type: none"> Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines; Keep the number of working or stationary vessels present on-site to the minimum anytime; and | All works area during the construction phase | I |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|------------------------|-----------|--------------|---|--|-----------------------------------|
| 14.9.1.13 to 14.9.1.18 | - | | <ul style="list-style-type: none"> ▪ Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators. | All works area during the construction phase | |
| | | | Mitigation for Indirect Disturbance due to Deterioration of Water Quality | | |
| | | | <ul style="list-style-type: none"> ▪ Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices; | | |
| | | | <ul style="list-style-type: none"> ▪ Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains); | | |
| | | | <ul style="list-style-type: none"> ▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and | | N/A |
| Table 15.6 | 12.3 | - | <ul style="list-style-type: none"> ▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources. | | |
| | | | Landscape and Visual Impact – Construction Phase | | |
| | | | CM1 - The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape. | | |
| | | | | | |
| | | | | | |
| Table 15.6 | 12.3 | - | CM2 - Reduction of construction period to practical minimum. | All works areas for duration of works; Upon handover and completion of works. | |
| Table 15.6 | 12.3 | - | CM3 - Phasing of the construction stage to reduce visual impacts during the construction phase. | All works areas for duration of works; Upon handover and completion of works. | |
| Table 15.6 | 12.3 | - | CM4 - Construction traffic (land and sea) including construction plants, construction vessels and barges should be kept to a practical minimum. | All works areas for duration of works; Upon handover and completion of works. | |
| Table 15.6 | 12.3 | - | CM5 - Erection of decorative mesh screens or construction hoardings around works areas in visually unobtrusive colours. | All works areas for duration of works; Upon handover and completion of works. – | |

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|--|-----------|--------------|---|--|-----------------------------------|
| | | | | may be disassembled in phases | |
| Table 15.6 | 12.3 | - | CM6 - Avoidance of excessive height and bulk of site buildings and structures. | New passenger concourse, terminal 2 expansion and other proposed airport related buildings and structures under the project; Upon handover and completion of works. | N/A |
| Table 15.6 | 12.3 | - | CM7 - Control of night-time lighting by hooding all lights and through minimisation of night working periods. | All works areas for duration of works; Upon handover and completion of works. – may be disassembled in phases | I |
| Table 15.6 | 12.3 | - | CM8 - All existing trees shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. | All existing trees to be retained; Upon handover and completion of works. | I |
| Table 15.6 | 12.3 | - | CM9 - Trees unavoidably affected by the works shall be transplanted where practical. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. | All existing trees to be affected by the works; Upon handover and completion of works. | I |
| Table 15.6 | 12.3 | - | CM10 - Land formation works shall be followed with advanced hydroseeding around taxiways and runways as soon as practical. | All affected existing grass areas around runways and verges/Duration of works; Upon handover and completion of works. | N/A |
| Cultural Heritage Impact – Construction Phase | | | | | |
| Not applicable. | | | | | |

Expansion of Hong Kong International Airport into a Three-Runway System

| EIA Ref. | EM&A Ref. | EP Condition | Environmental Protection Measures | Location / Duration of measures Timing of completion of measures | Mitigation Measures Implemented?^ |
|----------|-----------|--------------|---|---|-----------------------------------|
| | | | Health Impact – Aircraft Emissions | | |
| | | | Not applicable. | | |
| | | | Health Impact – Aircraft Noise | | |
| | | | Not applicable. | | |

Notes:

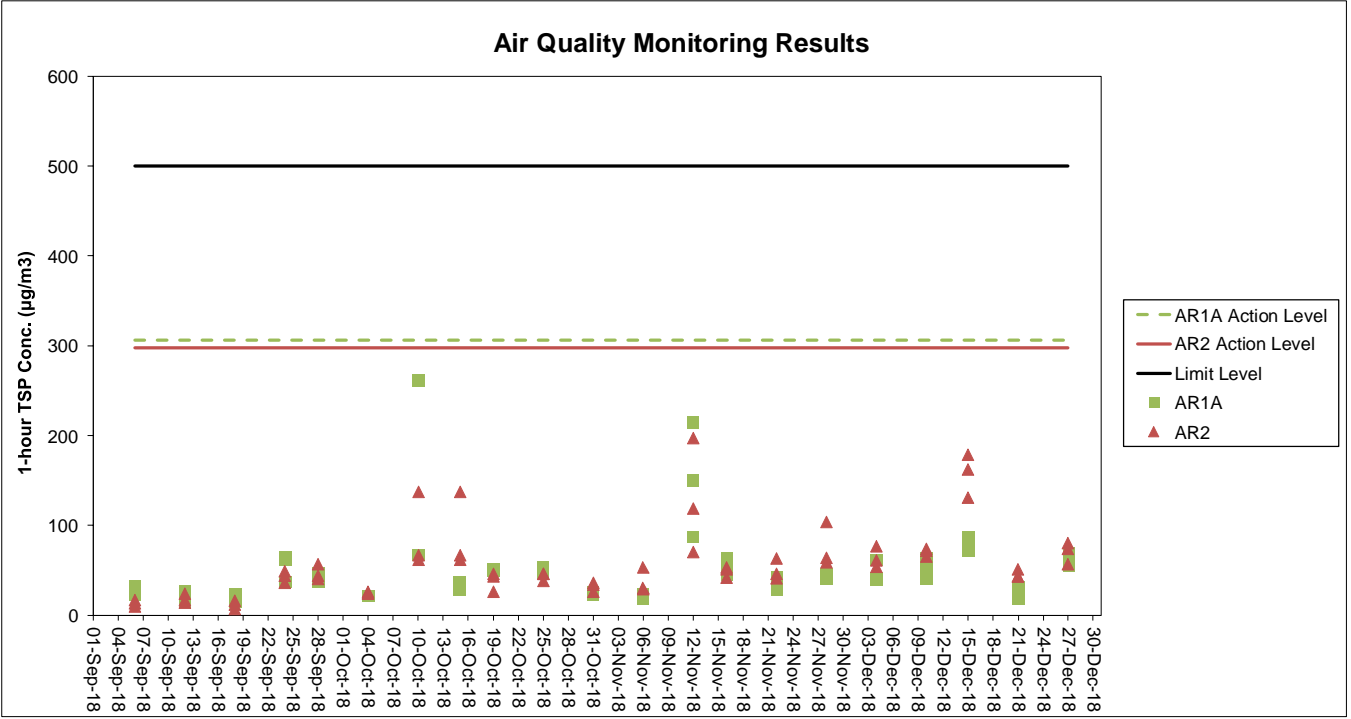
I= implemented where applicable;

N/A= not applicable to the construction works implemented during the reporting month.

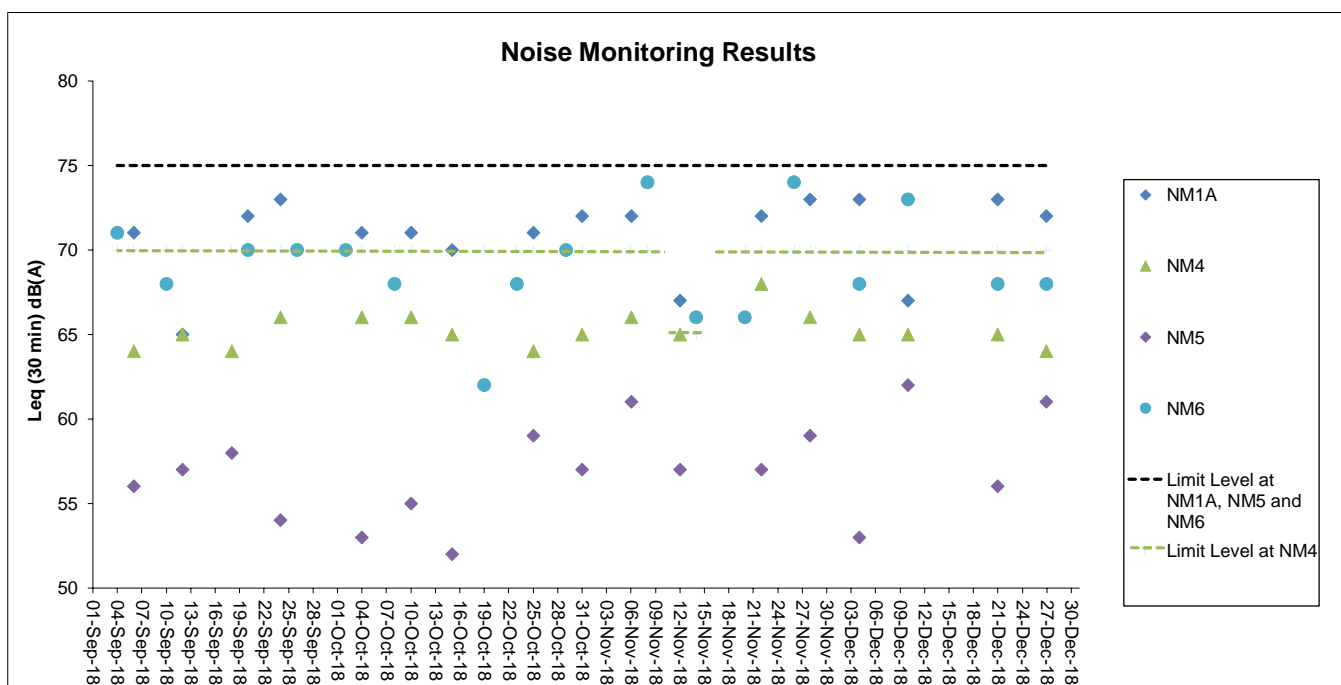
^ Checked by ET through site inspection and record provided by the Contractor.

Appendix C. Monitoring Results

Air Quality Monitoring Results

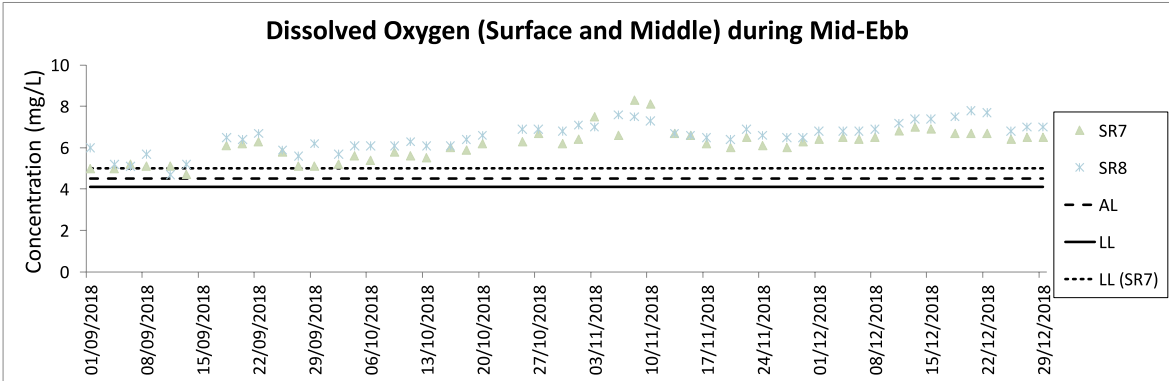
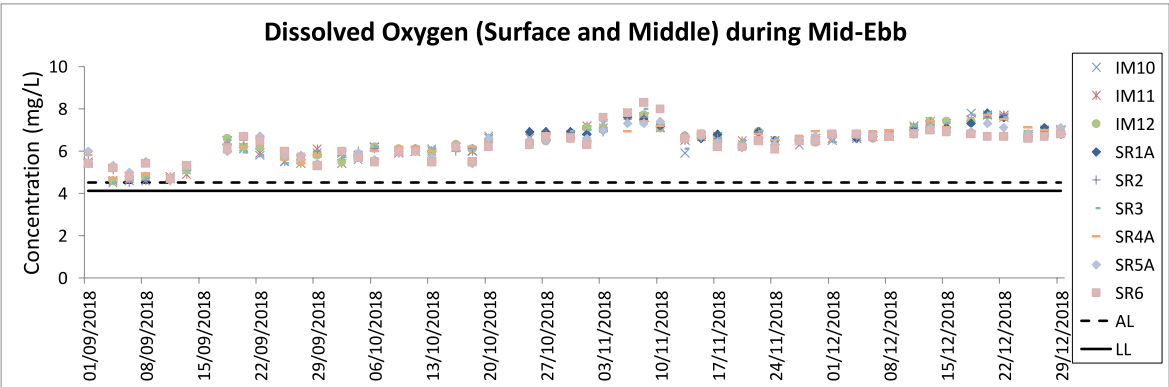
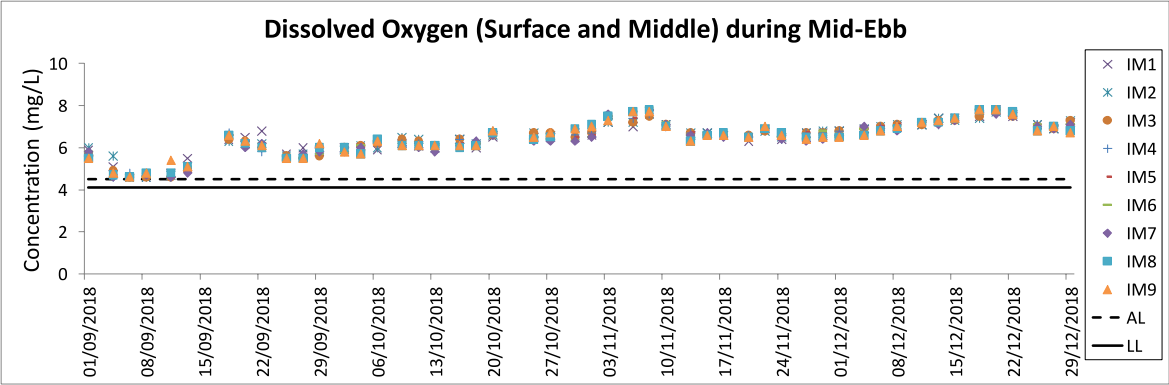
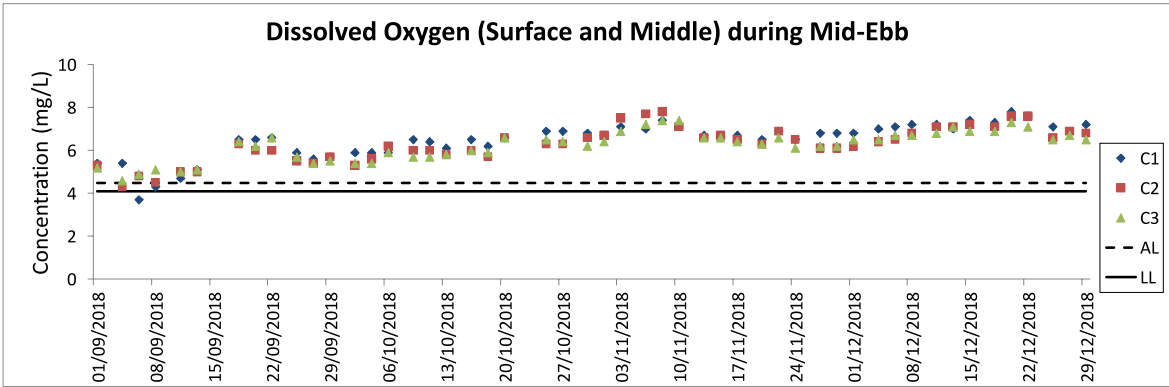


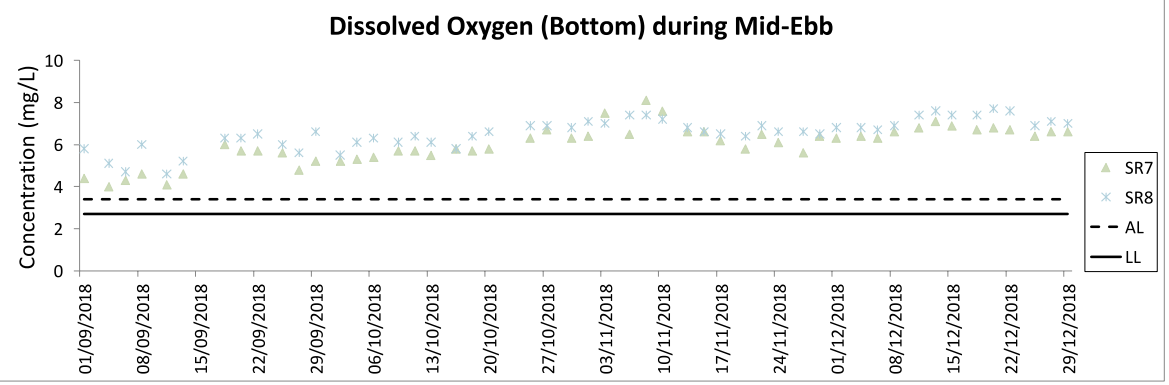
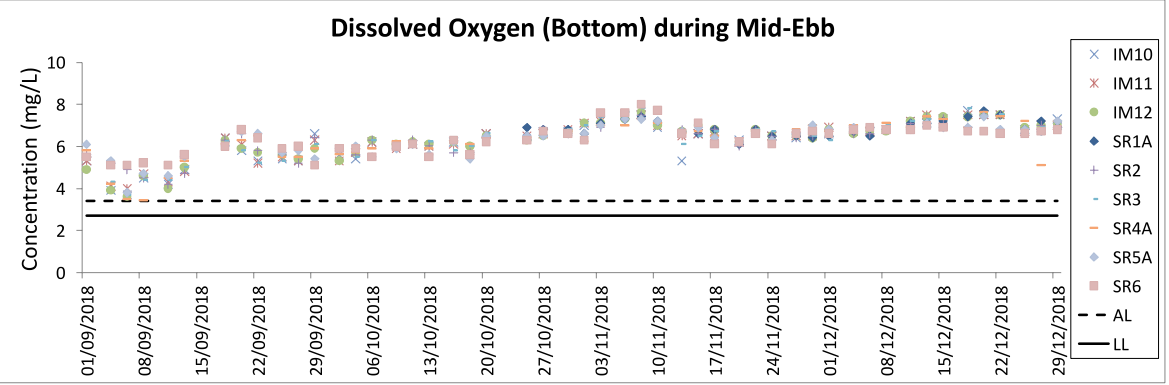
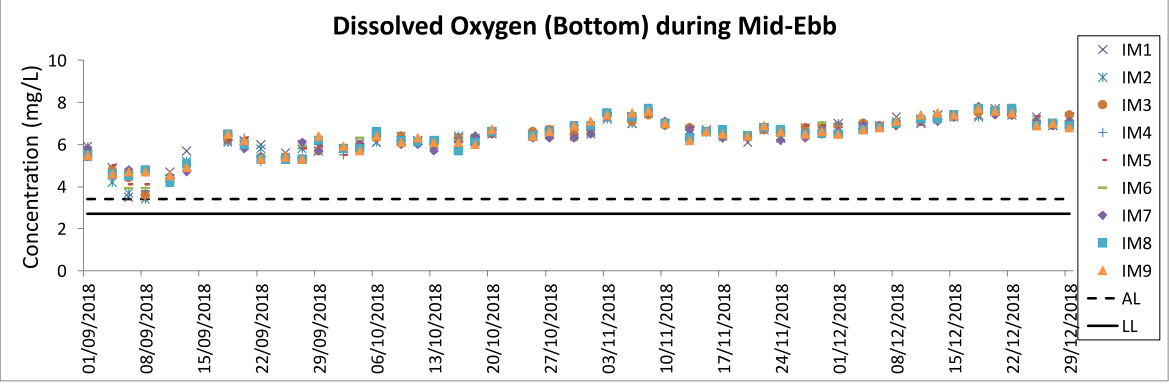
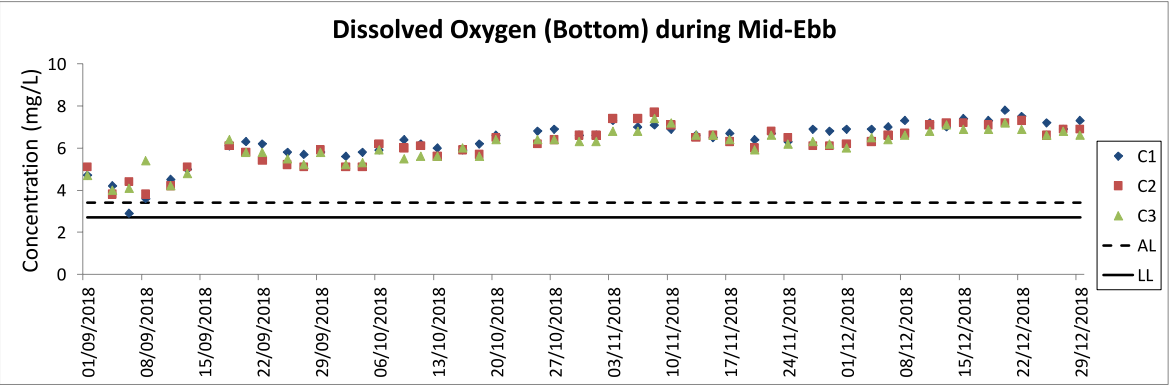
Noise Monitoring Results

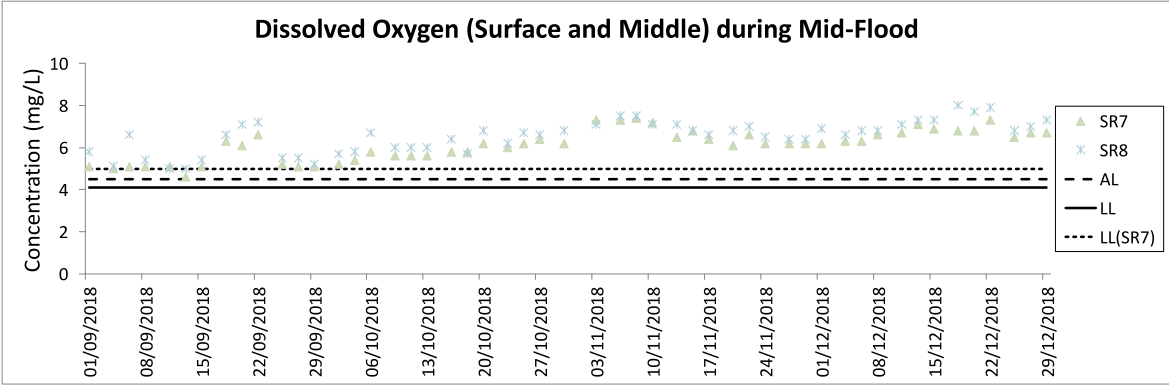
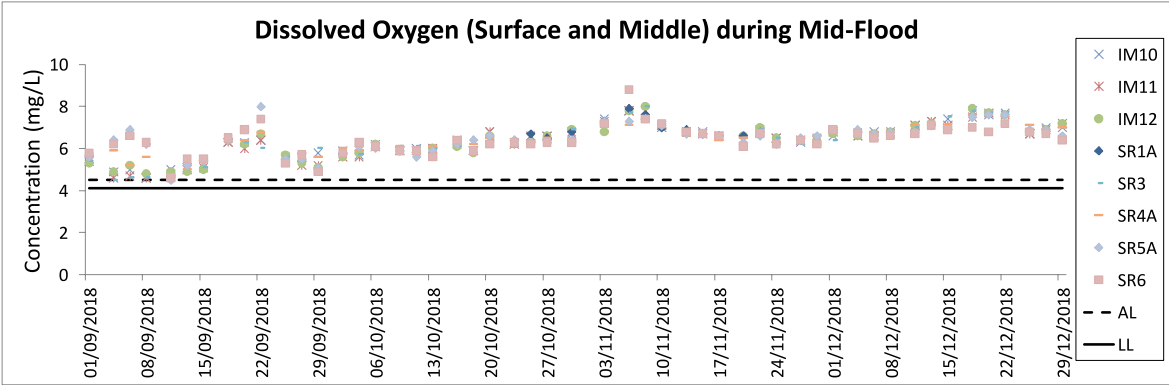
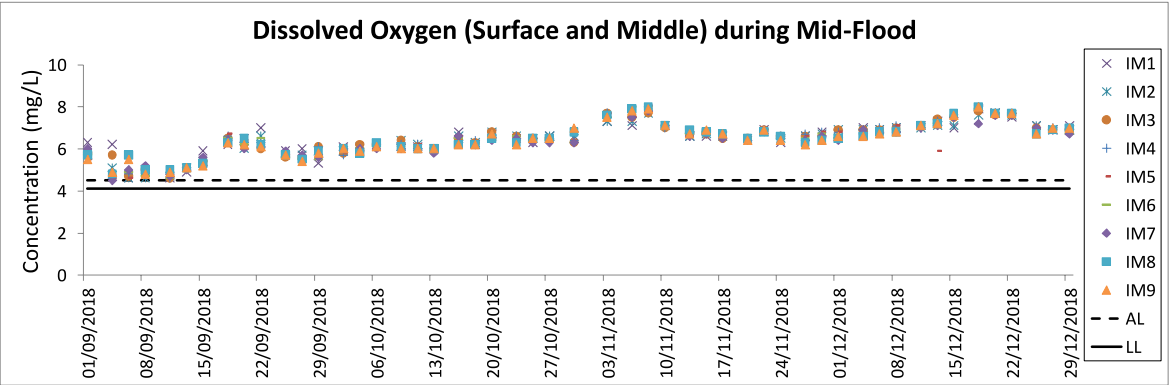
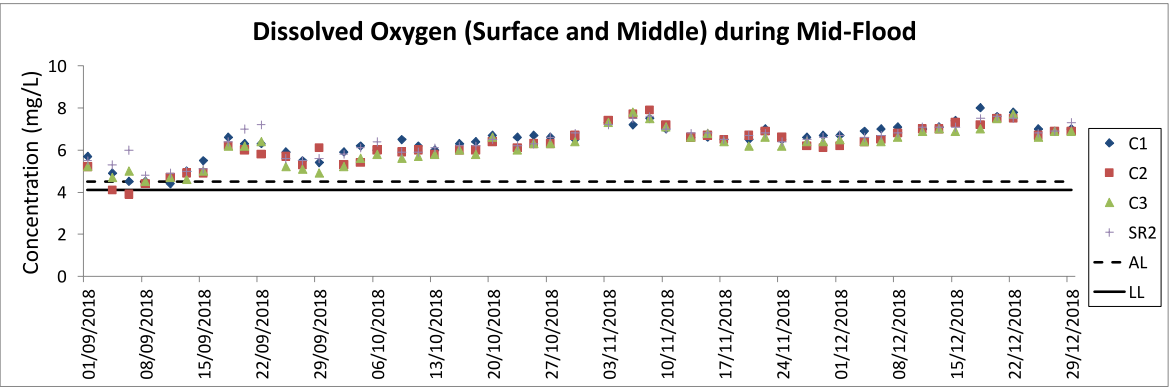


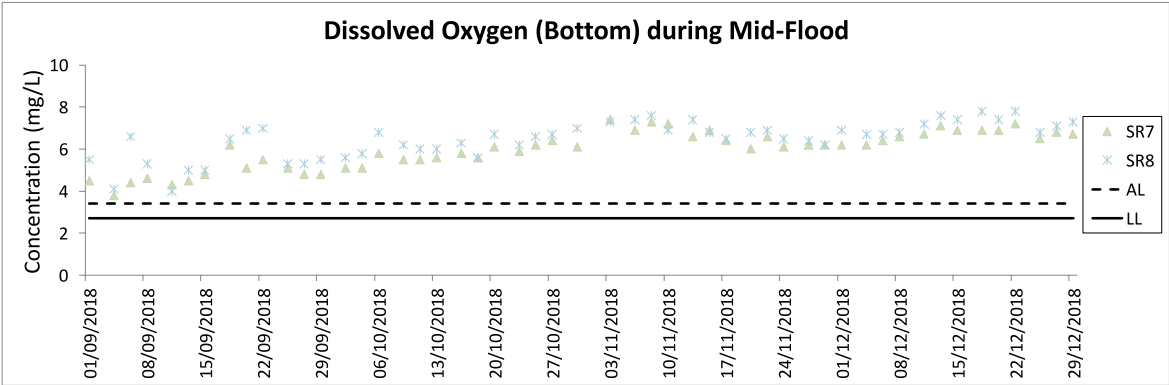
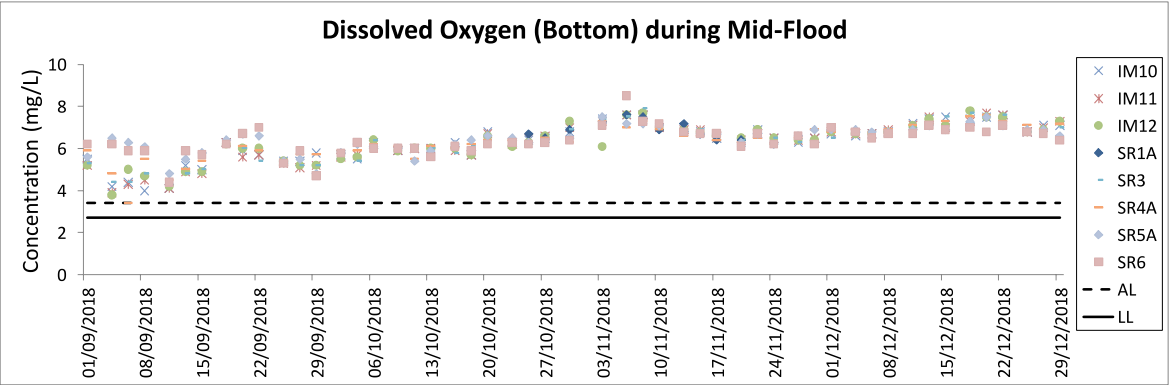
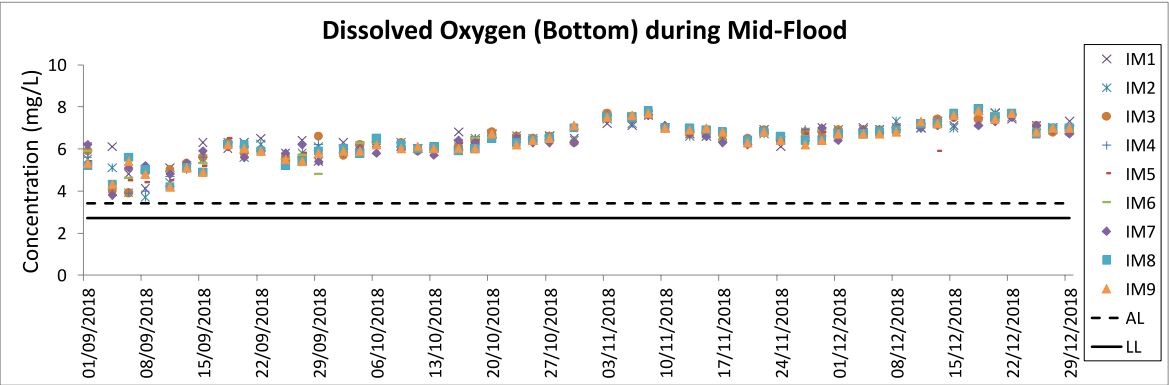
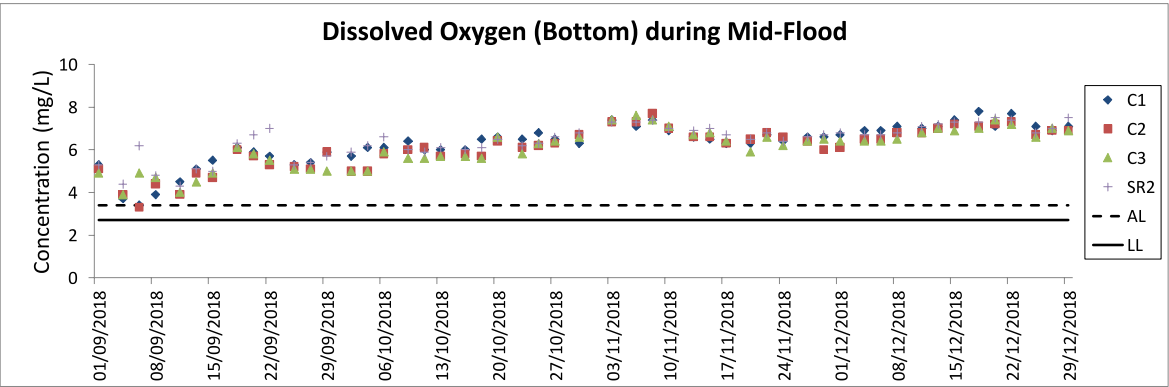
Note: School examination took place from 9 to 15 November 2018 in the reporting period.

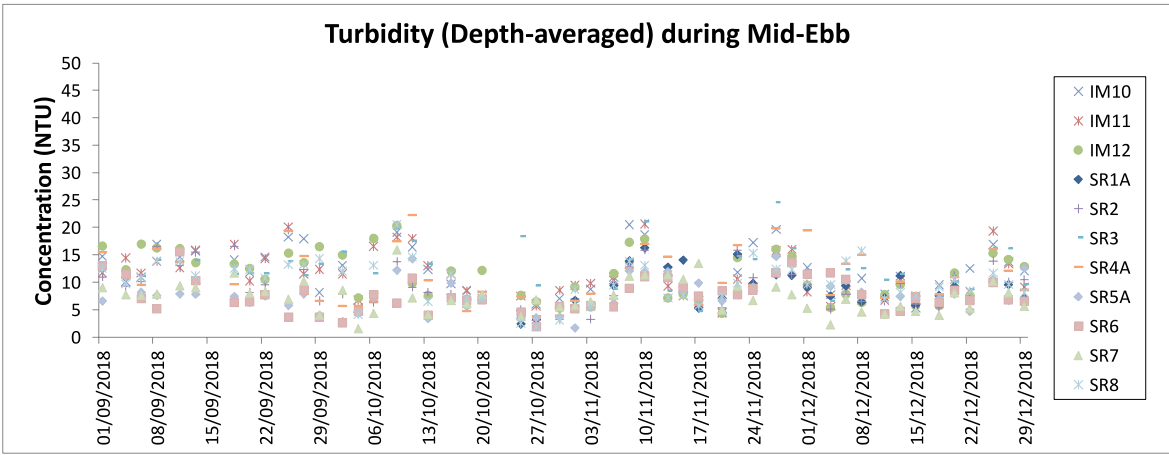
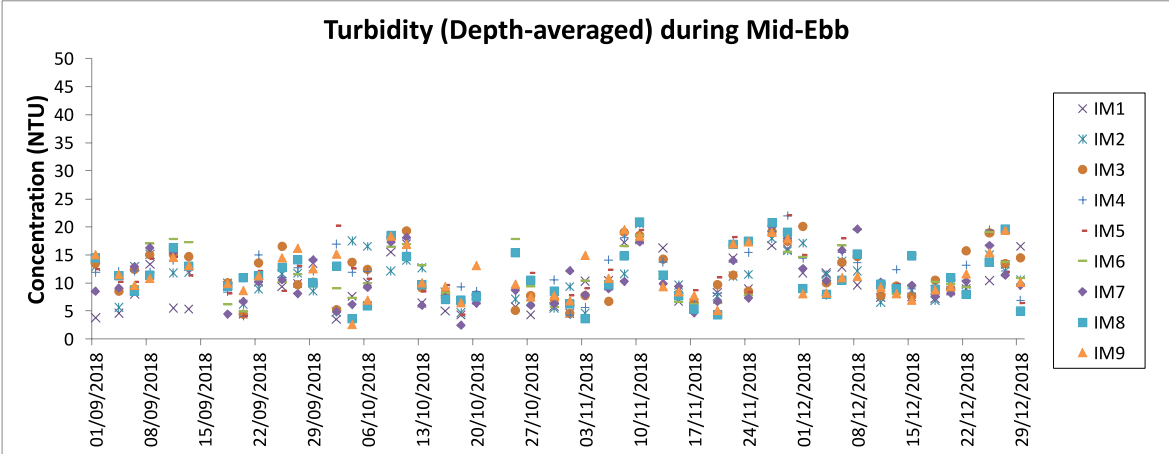
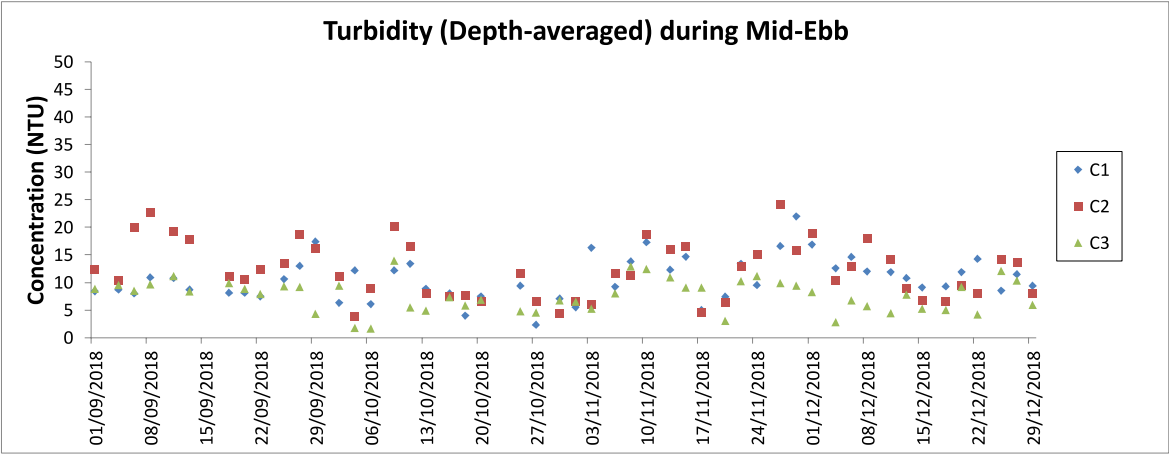
Water Quality Monitoring Results



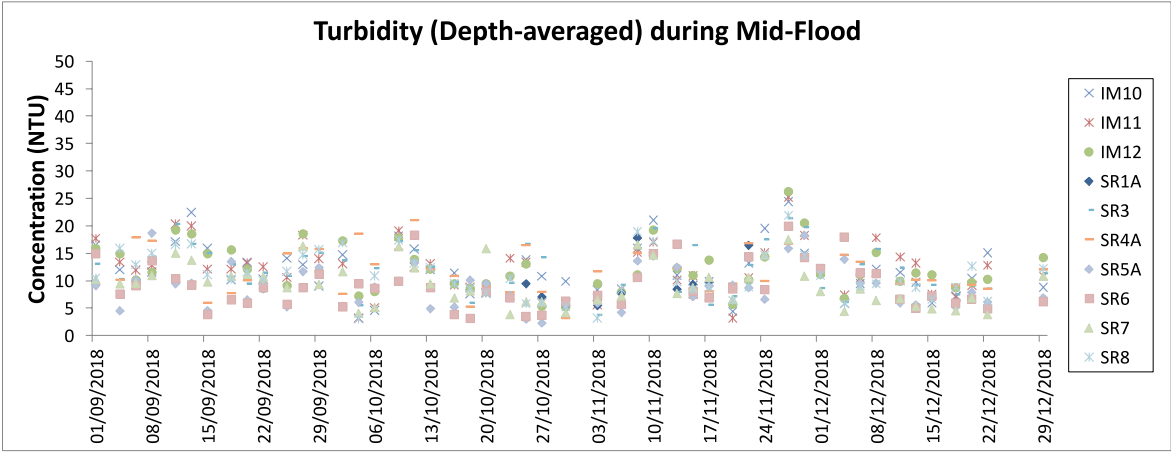
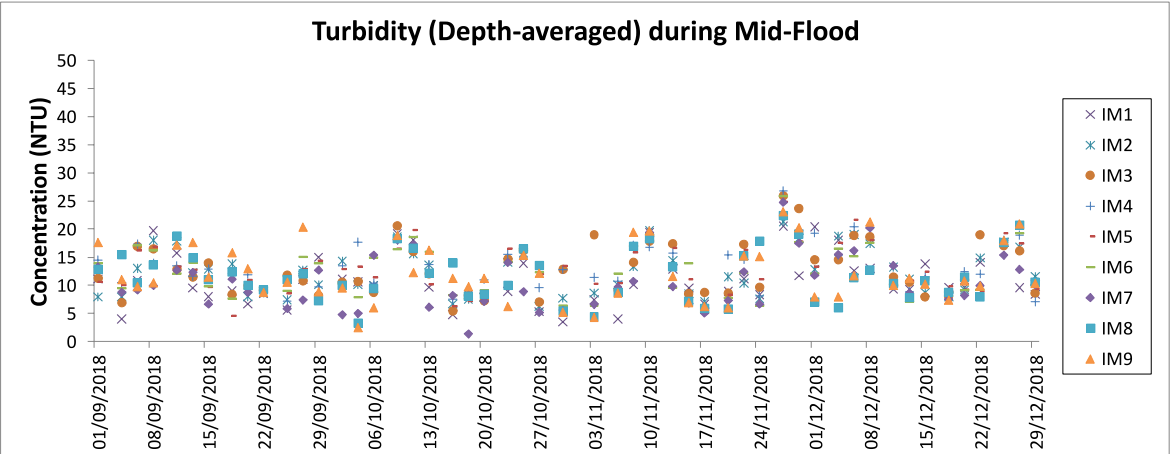
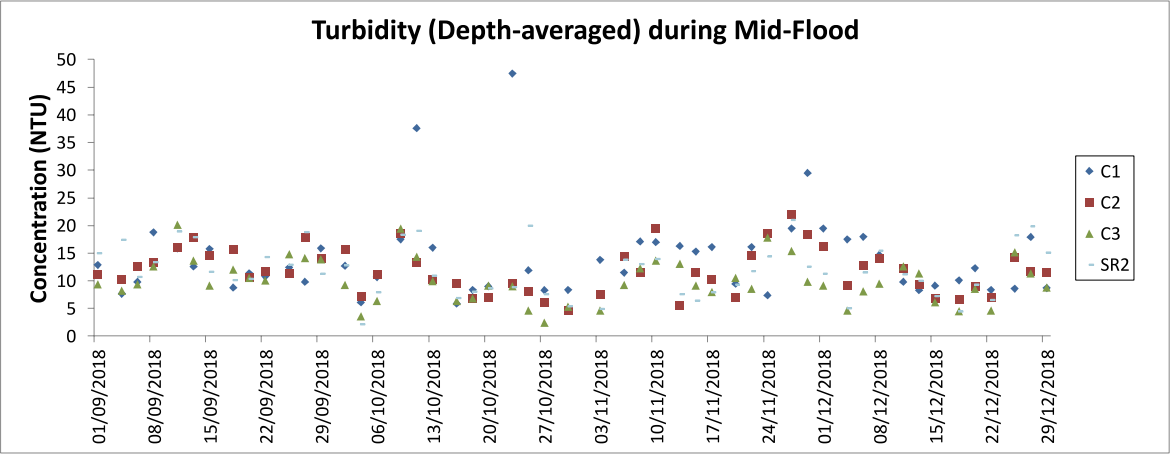




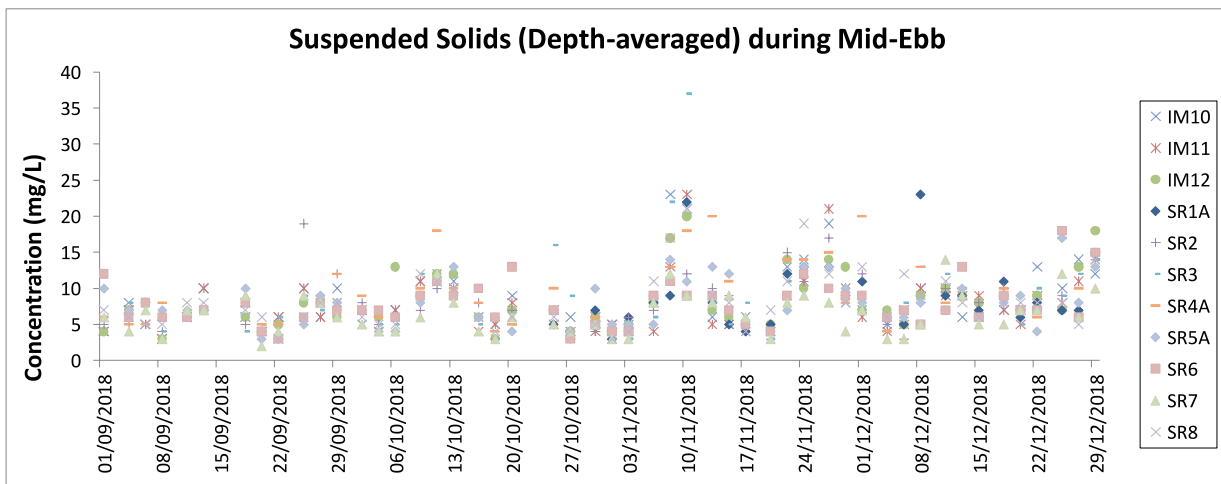
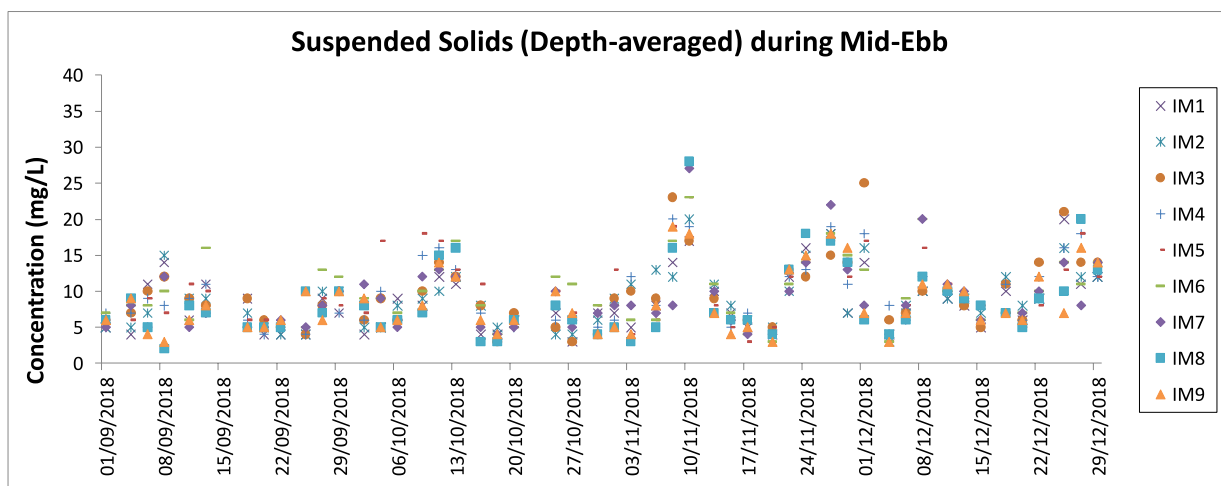
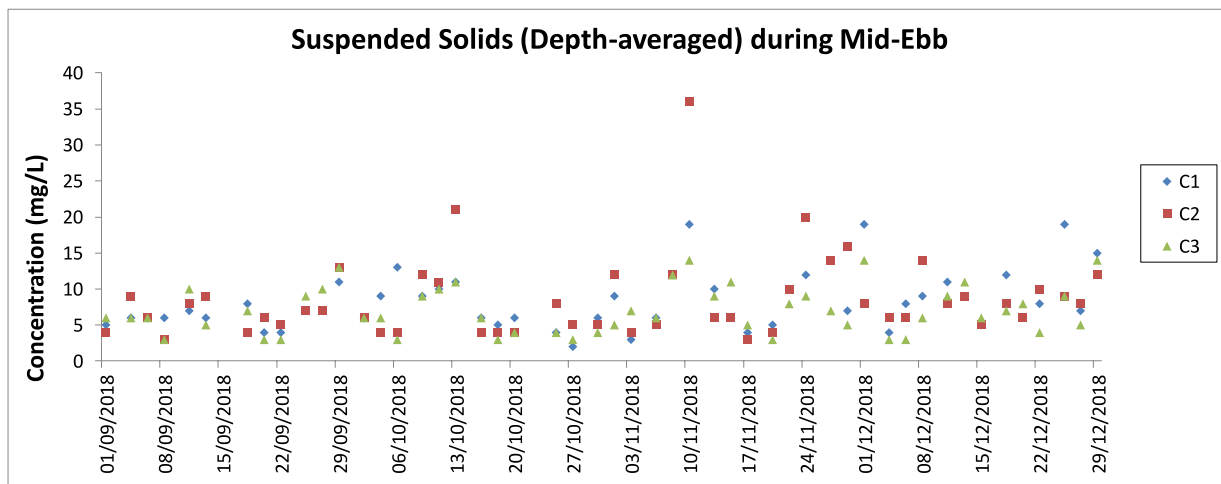




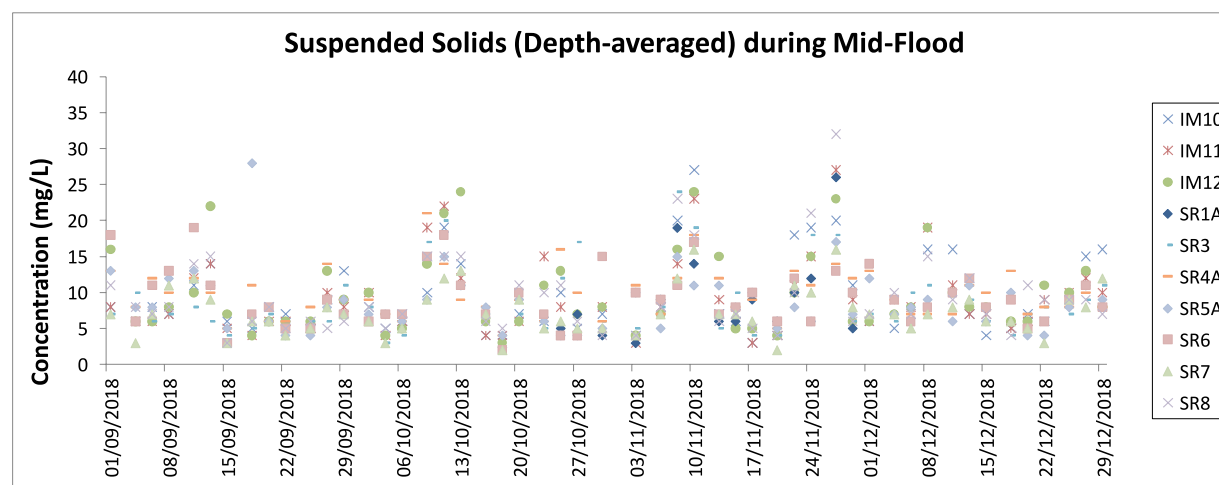
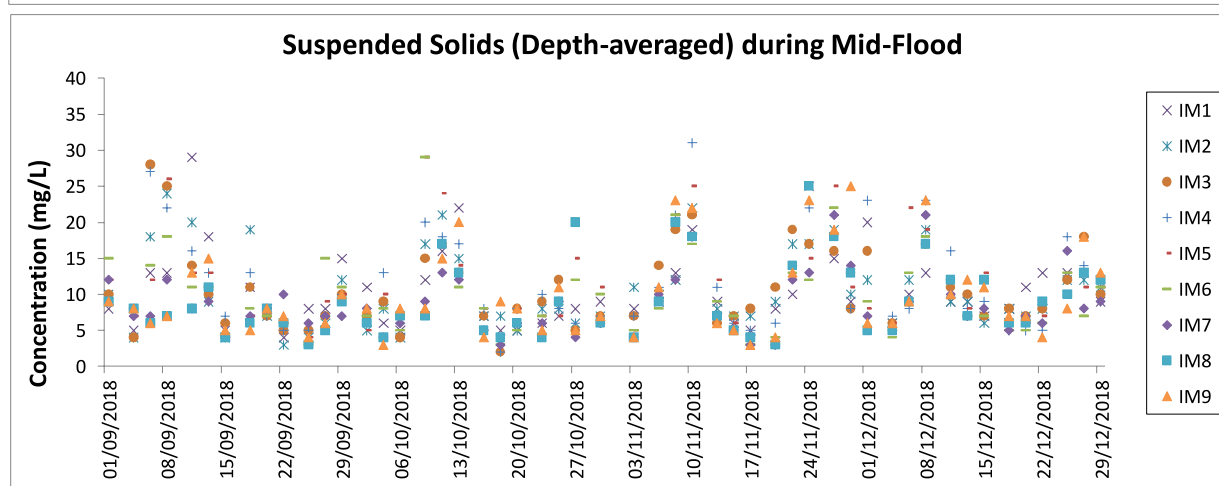
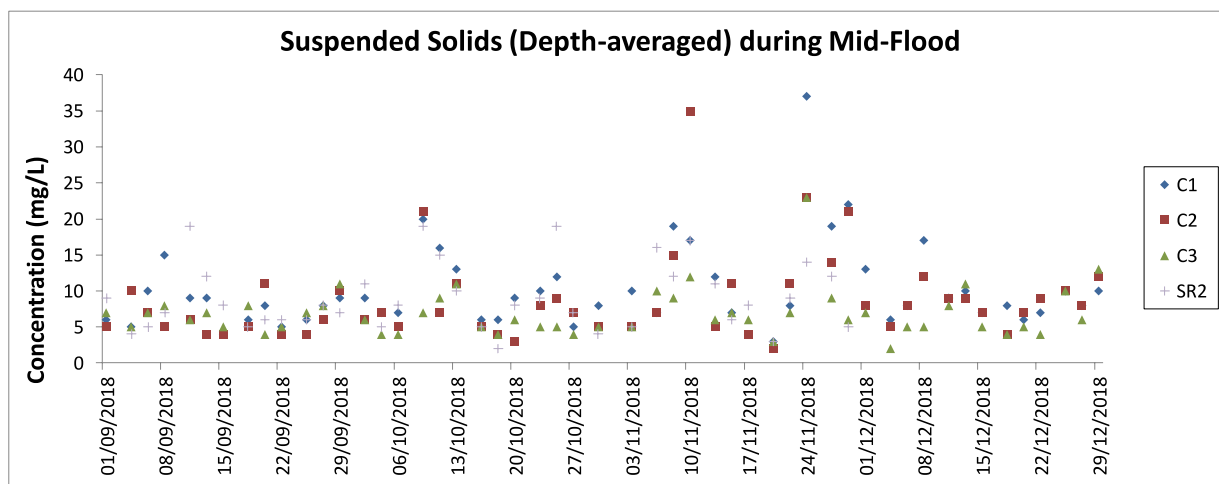
Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



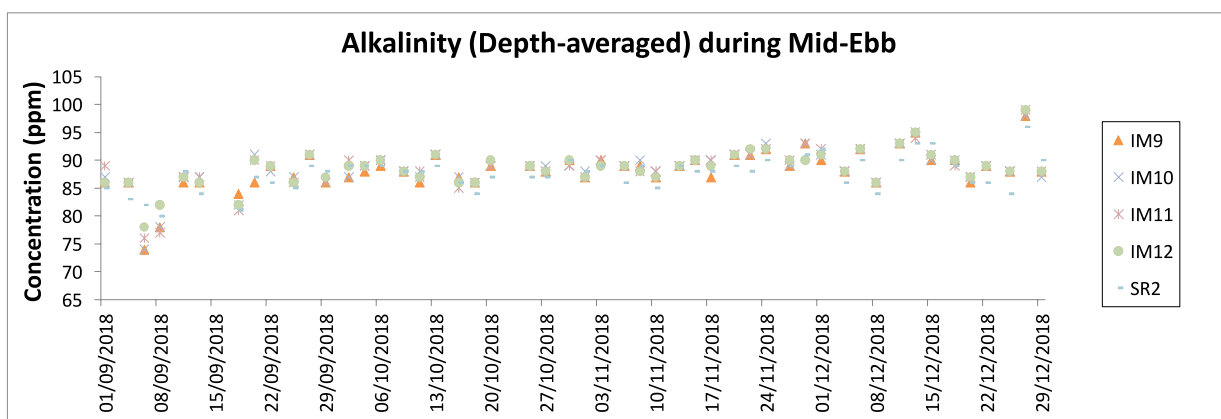
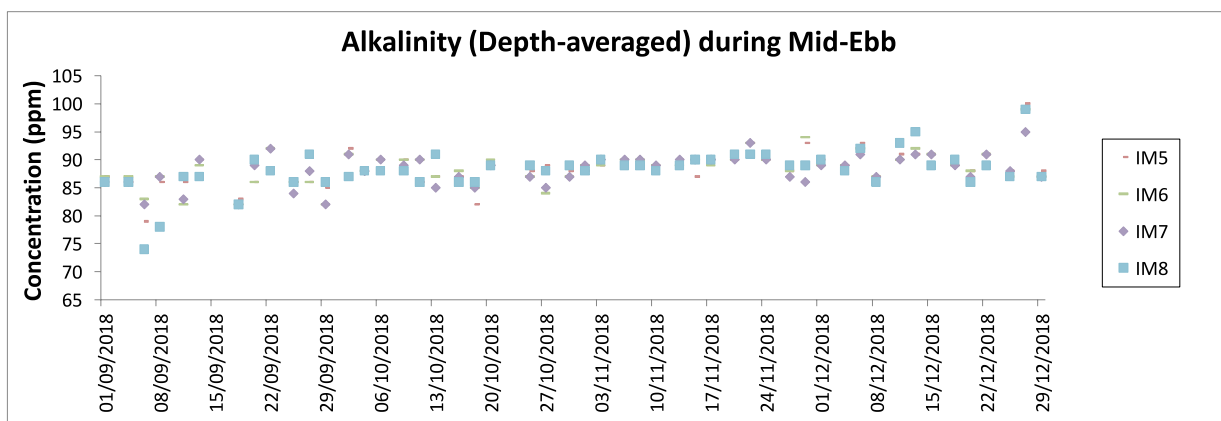
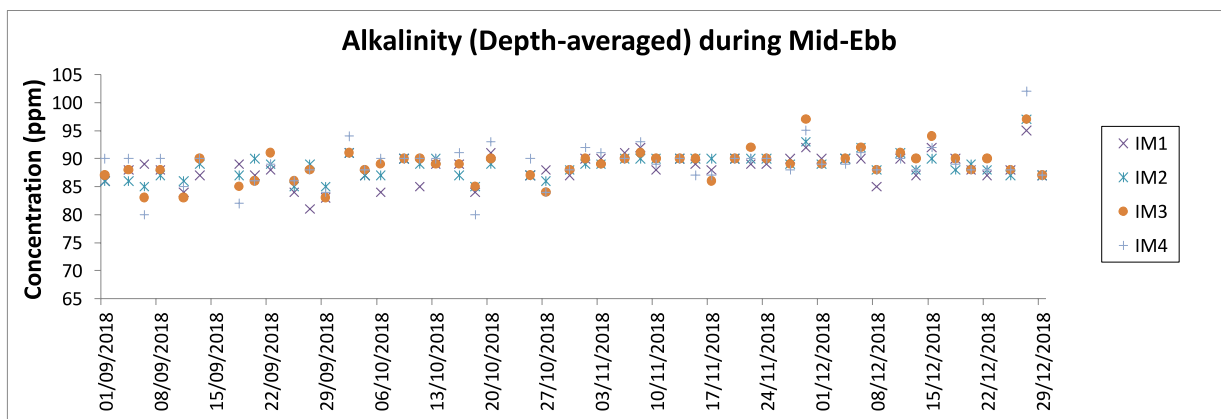
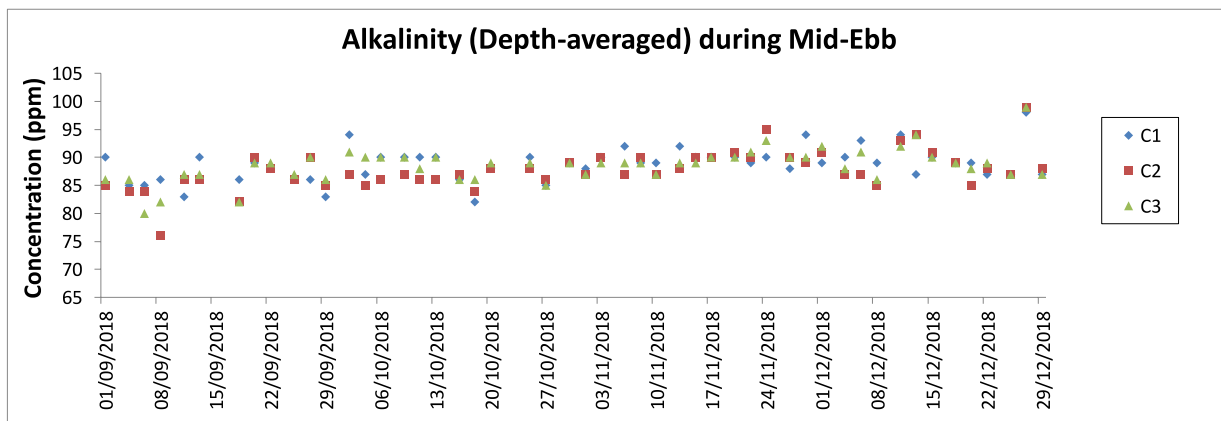
Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



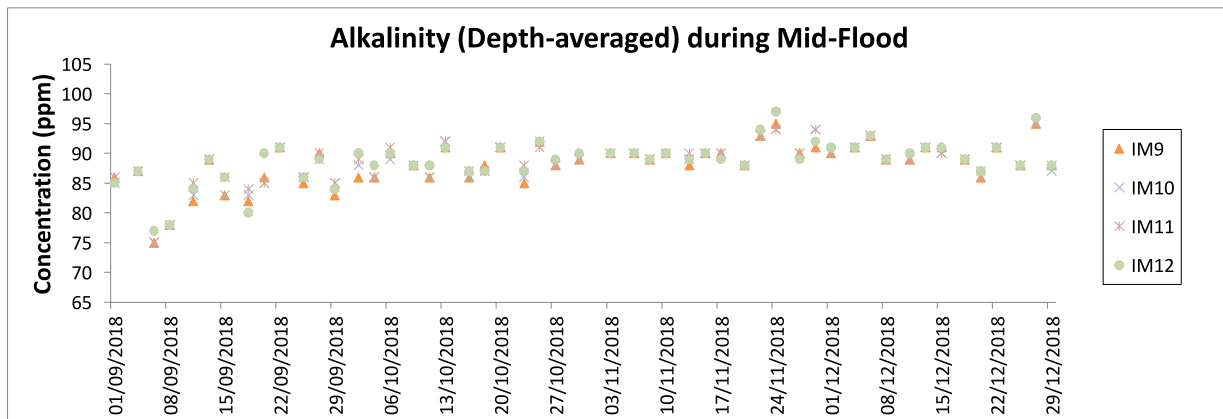
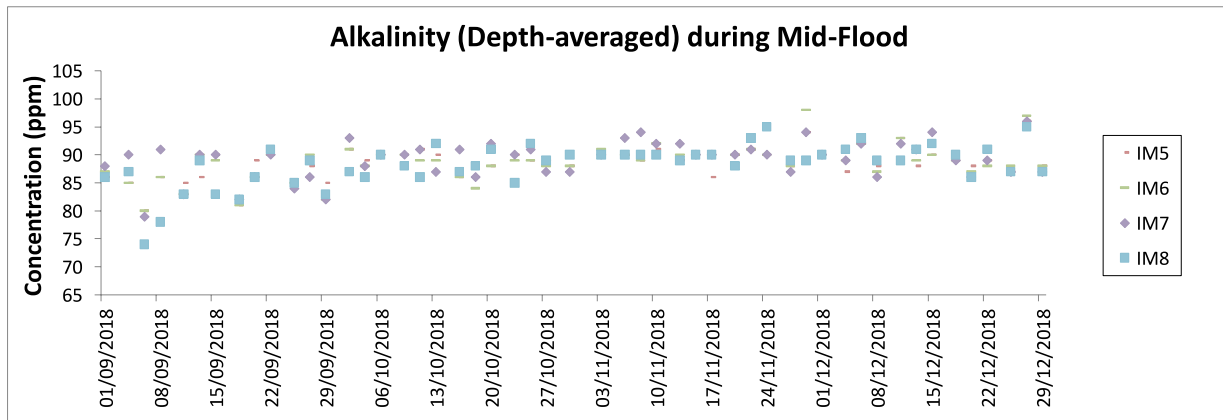
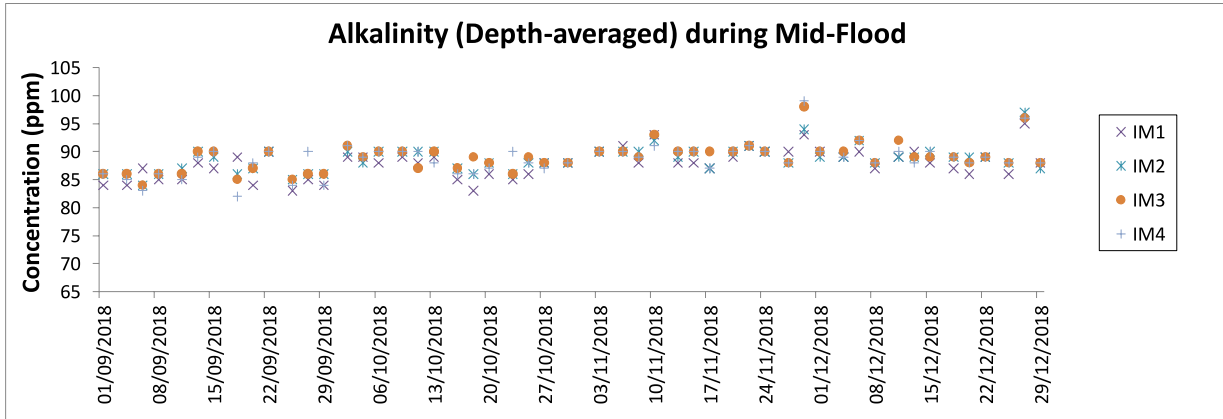
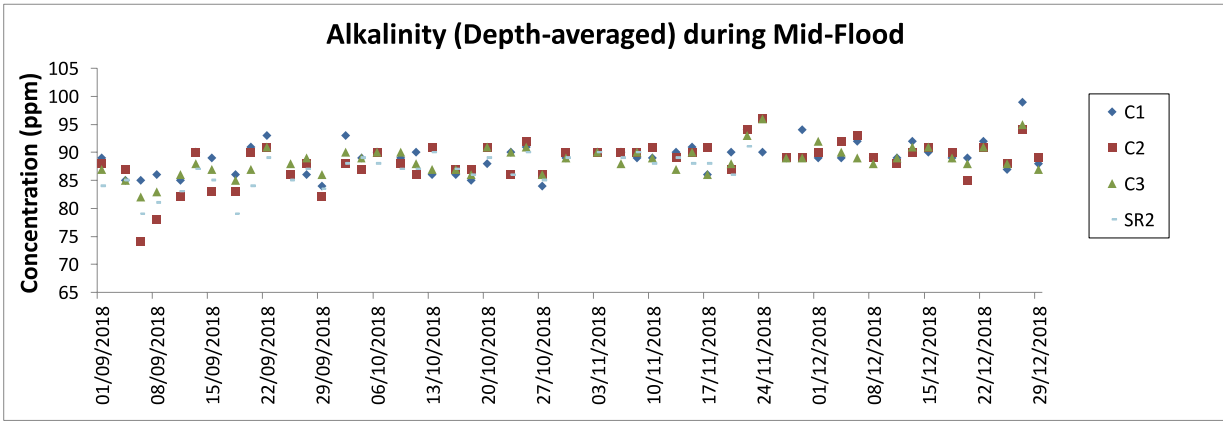
Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



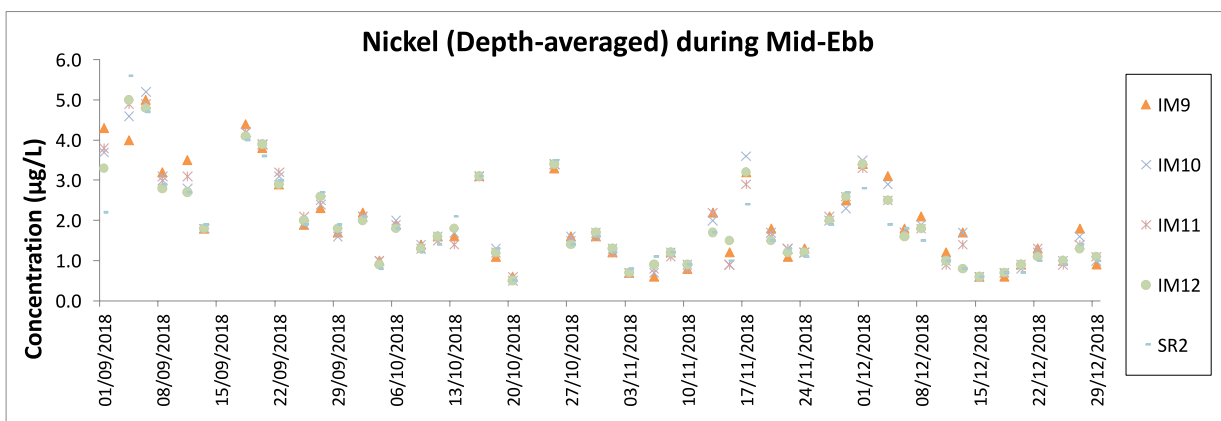
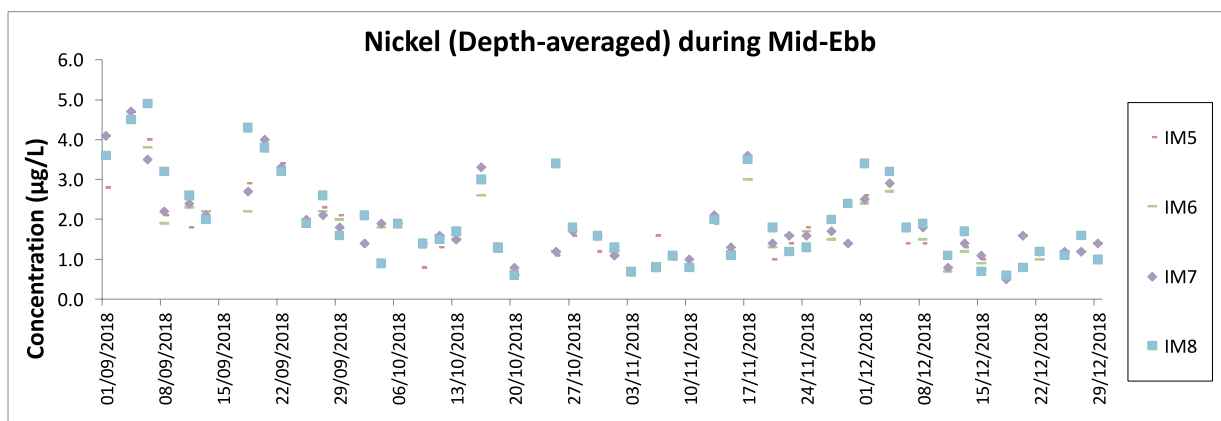
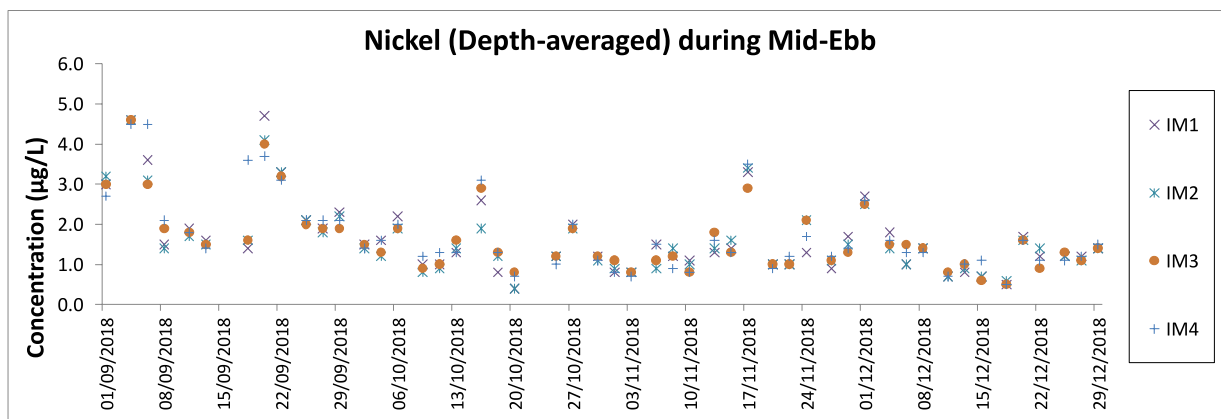
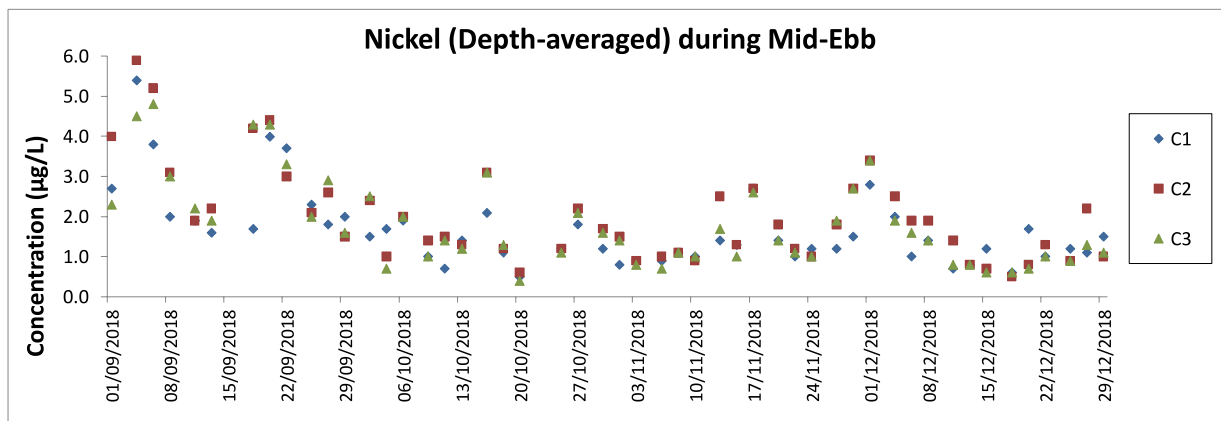
Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



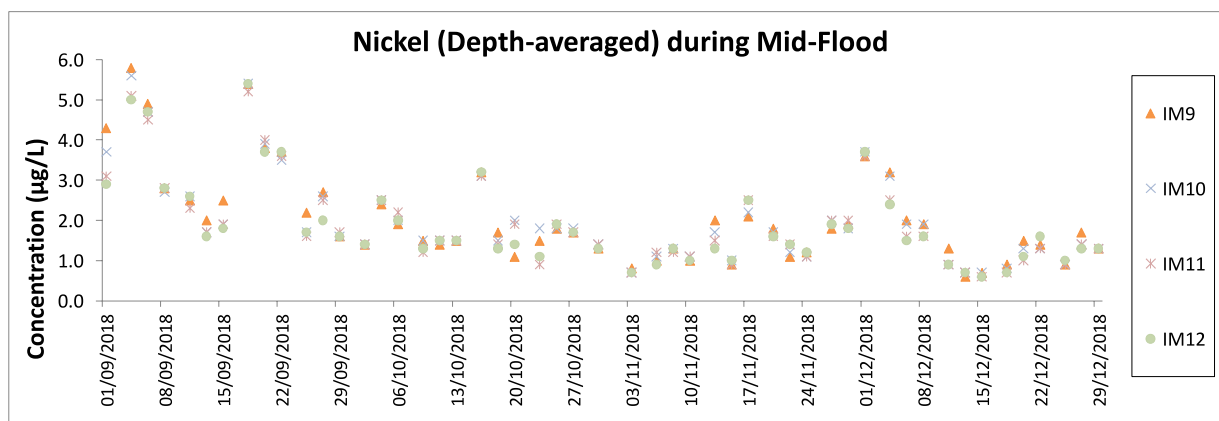
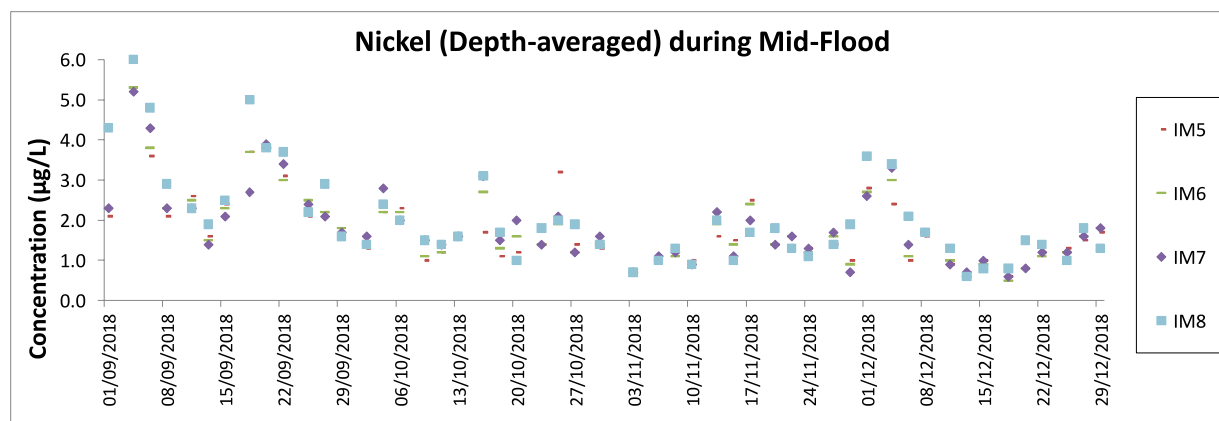
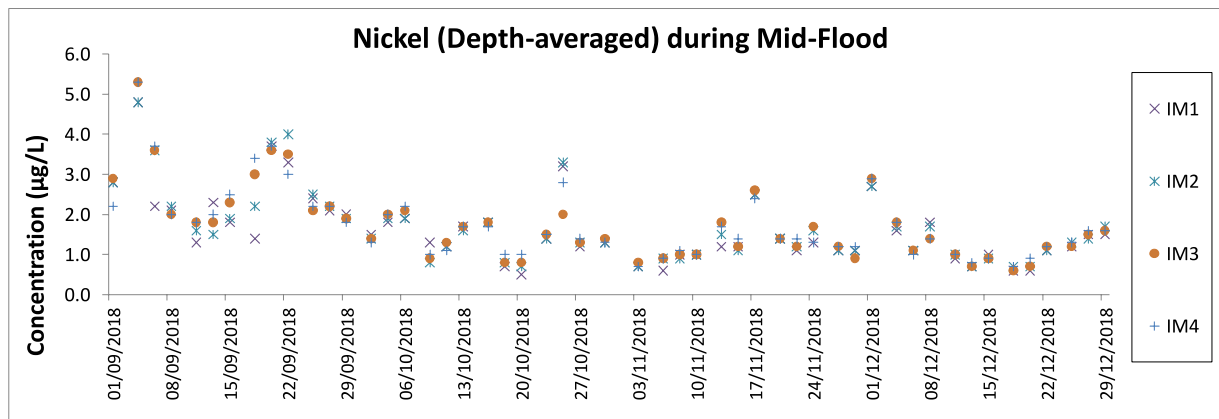
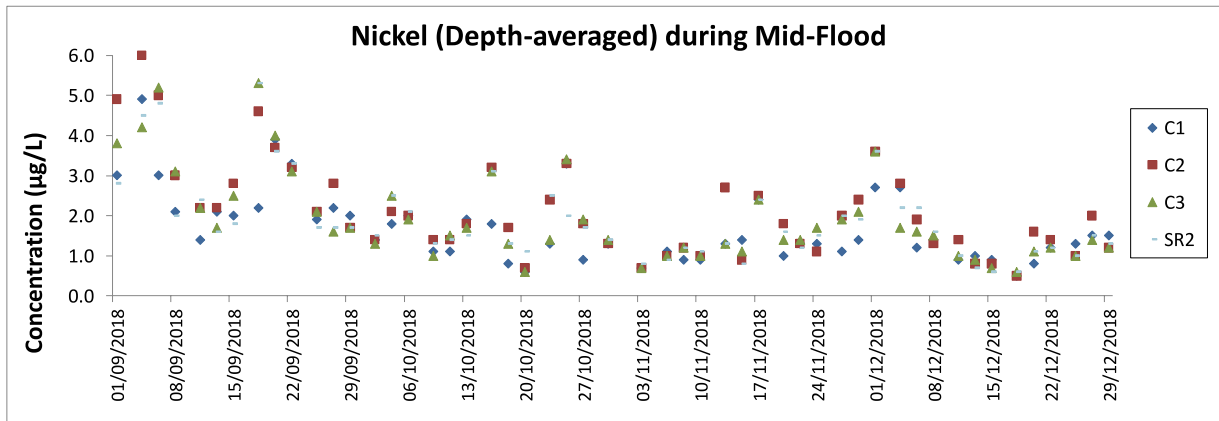
Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



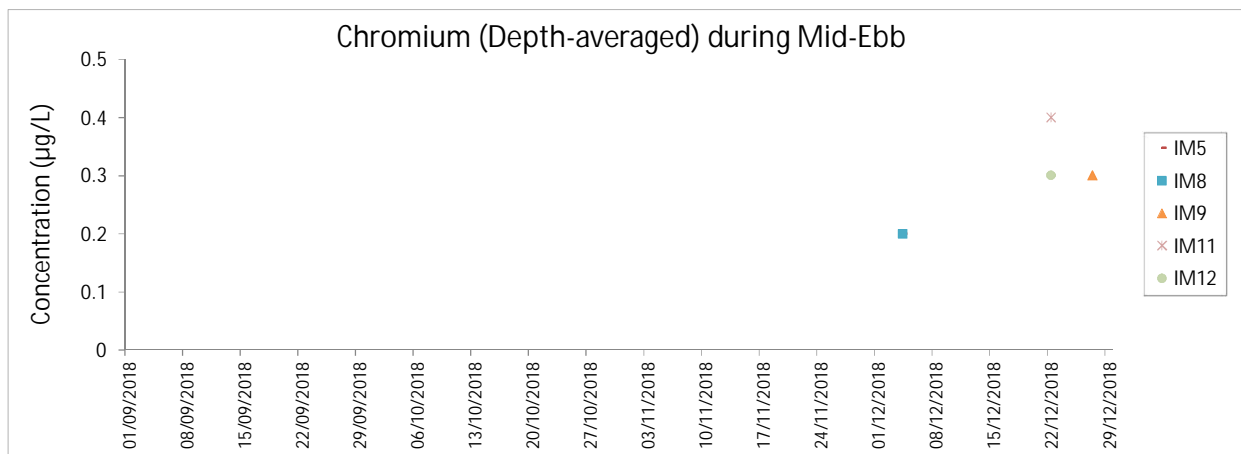
Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.



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Note: The action and limit level can be referred to Table 2.7 of the Quarterly EM&A report.
The monitoring results of chromium at all other monitoring stations during Mid-Ebb tide were below the reporting limit 0.2 µg/L.
The monitoring results of chromium at all monitoring stations during Mid-Flood tide were below the reporting limit 0.2 µg/L.

Chinese White Dolphin Monitoring Results

CWD Small Vessel Line-transect Survey

Survey Effort Data

| DATE | AREA | BEAU | KM SEARCHED | SEASON | VESSEL | TYPE | P/S |
|-----------|------|------|-------------|--------|--------|--------|-----|
| 4-Oct-18 | AW | 2 | 1.010 | AUTUMN | 32166 | 3RS ET | P |
| 4-Oct-18 | AW | 3 | 3.830 | AUTUMN | 32166 | 3RS ET | P |
| 4-Oct-18 | WL | 3 | 16.560 | AUTUMN | 32166 | 3RS ET | P |
| 4-Oct-18 | WL | 4 | 3.020 | AUTUMN | 32166 | 3RS ET | P |
| 4-Oct-18 | WL | 2 | 0.740 | AUTUMN | 32166 | 3RS ET | S |
| 4-Oct-18 | WL | 3 | 8.310 | AUTUMN | 32166 | 3RS ET | S |
| 4-Oct-18 | WL | 4 | 1.110 | AUTUMN | 32166 | 3RS ET | S |
| 5-Oct-18 | NWL | 2 | 9.800 | AUTUMN | 32166 | 3RS ET | P |
| 5-Oct-18 | NWL | 3 | 37.010 | AUTUMN | 32166 | 3RS ET | P |
| 5-Oct-18 | NWL | 4 | 15.400 | AUTUMN | 32166 | 3RS ET | P |
| 5-Oct-18 | NWL | 2 | 1.100 | AUTUMN | 32166 | 3RS ET | S |
| 5-Oct-18 | NWL | 3 | 8.290 | AUTUMN | 32166 | 3RS ET | S |
| 5-Oct-18 | NWL | 4 | 1.400 | AUTUMN | 32166 | 3RS ET | S |
| 8-Oct-18 | NWL | 2 | 45.386 | AUTUMN | 32166 | 3RS ET | P |
| 8-Oct-18 | NWL | 3 | 14.046 | AUTUMN | 32166 | 3RS ET | P |
| 8-Oct-18 | NWL | 2 | 10.674 | AUTUMN | 32166 | 3RS ET | S |
| 8-Oct-18 | NWL | 3 | 1.390 | AUTUMN | 32166 | 3RS ET | S |
| 11-Oct-18 | NEL | 2 | 15.780 | AUTUMN | 32166 | 3RS ET | P |
| 11-Oct-18 | NEL | 3 | 19.940 | AUTUMN | 32166 | 3RS ET | P |
| 11-Oct-18 | NEL | 4 | 1.900 | AUTUMN | 32166 | 3RS ET | P |
| 11-Oct-18 | NEL | 2 | 3.580 | AUTUMN | 32166 | 3RS ET | S |
| 11-Oct-18 | NEL | 3 | 5.900 | AUTUMN | 32166 | 3RS ET | S |
| 12-Oct-18 | NEL | 2 | 29.540 | AUTUMN | 32166 | 3RS ET | P |
| 12-Oct-18 | NEL | 3 | 6.500 | AUTUMN | 32166 | 3RS ET | P |
| 12-Oct-18 | NEL | 2 | 7.440 | AUTUMN | 32166 | 3RS ET | S |
| 12-Oct-18 | NEL | 3 | 2.900 | AUTUMN | 32166 | 3RS ET | S |
| 23-Oct-18 | SWL | 2 | 24.730 | AUTUMN | 32166 | 3RS ET | P |
| 23-Oct-18 | SWL | 3 | 31.390 | AUTUMN | 32166 | 3RS ET | P |
| 23-Oct-18 | SWL | 2 | 9.780 | AUTUMN | 32166 | 3RS ET | S |
| 23-Oct-18 | SWL | 3 | 5.100 | AUTUMN | 32166 | 3RS ET | S |
| 24-Oct-18 | AW | 2 | 4.710 | AUTUMN | 32166 | 3RS ET | P |
| 24-Oct-18 | WL | 2 | 13.470 | AUTUMN | 32166 | 3RS ET | P |
| 24-Oct-18 | WL | 3 | 4.494 | AUTUMN | 32166 | 3RS ET | P |
| 24-Oct-18 | WL | 4 | 1.000 | AUTUMN | 32166 | 3RS ET | P |
| 24-Oct-18 | WL | 2 | 6.760 | AUTUMN | 32166 | 3RS ET | S |
| 24-Oct-18 | WL | 3 | 2.240 | AUTUMN | 32166 | 3RS ET | S |
| 24-Oct-18 | WL | 4 | 0.300 | AUTUMN | 32166 | 3RS ET | S |
| 24-Oct-18 | WL | 5 | 0.500 | AUTUMN | 32166 | 3RS ET | S |
| 26-Oct-18 | SWL | 2 | 25.709 | AUTUMN | 32166 | 3RS ET | P |
| 26-Oct-18 | SWL | 3 | 30.667 | AUTUMN | 32166 | 3RS ET | P |
| 26-Oct-18 | SWL | 2 | 9.234 | AUTUMN | 32166 | 3RS ET | S |
| 26-Oct-18 | SWL | 3 | 5.860 | AUTUMN | 32166 | 3RS ET | S |
| 6-Nov-18 | NWL | 2 | 7.350 | AUTUMN | 32166 | 3RS ET | P |
| 6-Nov-18 | NWL | 3 | 40.500 | AUTUMN | 32166 | 3RS ET | P |
| 6-Nov-18 | NWL | 4 | 12.930 | AUTUMN | 32166 | 3RS ET | P |

| DATE | AREA | BEAU | KM SEARCHED | SEASON | VESSEL | TYPE | P/S |
|-----------|------|------|-------------|--------|--------|--------|-----|
| 6-Nov-18 | NWL | 2 | 2.000 | AUTUMN | 32166 | 3RS ET | S |
| 6-Nov-18 | NWL | 3 | 7.820 | AUTUMN | 32166 | 3RS ET | S |
| 6-Nov-18 | NWL | 4 | 1.800 | AUTUMN | 32166 | 3RS ET | S |
| 7-Nov-18 | NEL | 2 | 2.200 | AUTUMN | 32166 | 3RS ET | P |
| 7-Nov-18 | NEL | 3 | 30.480 | AUTUMN | 32166 | 3RS ET | P |
| 7-Nov-18 | NEL | 4 | 4.540 | AUTUMN | 32166 | 3RS ET | P |
| 7-Nov-18 | NEL | 2 | 0.700 | AUTUMN | 32166 | 3RS ET | S |
| 7-Nov-18 | NEL | 3 | 9.180 | AUTUMN | 32166 | 3RS ET | S |
| 12-Nov-18 | NWL | 2 | 60.880 | AUTUMN | 32166 | 3RS ET | P |
| 12-Nov-18 | NWL | 3 | 2.180 | AUTUMN | 32166 | 3RS ET | P |
| 12-Nov-18 | NWL | 2 | 12.440 | AUTUMN | 32166 | 3RS ET | S |
| 13-Nov-18 | NEL | 1 | 10.400 | AUTUMN | 32166 | 3RS ET | P |
| 13-Nov-18 | NEL | 2 | 13.700 | AUTUMN | 32166 | 3RS ET | P |
| 13-Nov-18 | NEL | 3 | 13.500 | AUTUMN | 32166 | 3RS ET | P |
| 13-Nov-18 | NEL | 1 | 1.800 | AUTUMN | 32166 | 3RS ET | S |
| 13-Nov-18 | NEL | 2 | 2.100 | AUTUMN | 32166 | 3RS ET | S |
| 13-Nov-18 | NEL | 3 | 5.600 | AUTUMN | 32166 | 3RS ET | S |
| 16-Nov-18 | AW | 2 | 2.900 | AUTUMN | 32166 | 3RS ET | P |
| 16-Nov-18 | AW | 3 | 1.910 | AUTUMN | 32166 | 3RS ET | P |
| 16-Nov-18 | WL | 2 | 2.752 | AUTUMN | 32166 | 3RS ET | P |
| 16-Nov-18 | WL | 3 | 10.665 | AUTUMN | 32166 | 3RS ET | P |
| 16-Nov-18 | WL | 4 | 2.306 | AUTUMN | 32166 | 3RS ET | P |
| 16-Nov-18 | WL | 2 | 1.680 | AUTUMN | 32166 | 3RS ET | S |
| 16-Nov-18 | WL | 3 | 5.483 | AUTUMN | 32166 | 3RS ET | S |
| 16-Nov-18 | WL | 4 | 0.355 | AUTUMN | 32166 | 3RS ET | S |
| 20-Nov-18 | AW | 3 | 2.570 | AUTUMN | 32166 | 3RS ET | P |
| 20-Nov-18 | AW | 4 | 1.950 | AUTUMN | 32166 | 3RS ET | P |
| 20-Nov-18 | WL | 2 | 6.864 | AUTUMN | 32166 | 3RS ET | P |
| 20-Nov-18 | WL | 3 | 6.279 | AUTUMN | 32166 | 3RS ET | P |
| 20-Nov-18 | WL | 4 | 5.049 | AUTUMN | 32166 | 3RS ET | P |
| 20-Nov-18 | WL | 5 | 1.710 | AUTUMN | 32166 | 3RS ET | P |
| 20-Nov-18 | WL | 2 | 6.792 | AUTUMN | 32166 | 3RS ET | S |
| 20-Nov-18 | WL | 3 | 1.259 | AUTUMN | 32166 | 3RS ET | S |
| 20-Nov-18 | WL | 4 | 1.812 | AUTUMN | 32166 | 3RS ET | S |
| 20-Nov-18 | WL | 5 | 0.370 | AUTUMN | 32166 | 3RS ET | S |
| 21-Nov-18 | SWL | 2 | 10.974 | AUTUMN | 32166 | 3RS ET | P |
| 21-Nov-18 | SWL | 3 | 29.690 | AUTUMN | 32166 | 3RS ET | P |
| 21-Nov-18 | SWL | 4 | 10.110 | AUTUMN | 32166 | 3RS ET | P |
| 21-Nov-18 | SWL | 5 | 1.200 | AUTUMN | 32166 | 3RS ET | P |
| 21-Nov-18 | SWL | 2 | 3.840 | AUTUMN | 32166 | 3RS ET | S |
| 21-Nov-18 | SWL | 3 | 9.400 | AUTUMN | 32166 | 3RS ET | S |
| 21-Nov-18 | SWL | 4 | 2.860 | AUTUMN | 32166 | 3RS ET | S |
| 23-Nov-18 | SWL | 2 | 17.802 | AUTUMN | 32166 | 3RS ET | P |
| 23-Nov-18 | SWL | 3 | 33.670 | AUTUMN | 32166 | 3RS ET | P |
| 23-Nov-18 | SWL | 4 | 4.260 | AUTUMN | 32166 | 3RS ET | P |
| 23-Nov-18 | SWL | 2 | 8.268 | AUTUMN | 32166 | 3RS ET | S |
| 23-Nov-18 | SWL | 3 | 6.410 | AUTUMN | 32166 | 3RS ET | S |

| DATE | AREA | BEAU | KM SEARCHED | SEASON | VESSEL | TYPE | P/S |
|-----------|------|------|-------------|--------|--------|--------|-----|
| 23-Nov-18 | SWL | 4 | 1.090 | AUTUMN | 32166 | 3RS ET | S |
| 3-Dec-18 | NWL | 2 | 40.660 | WINTER | 32166 | 3RS ET | P |
| 3-Dec-18 | NWL | 3 | 21.070 | WINTER | 32166 | 3RS ET | P |
| 3-Dec-18 | NWL | 2 | 9.970 | WINTER | 32166 | 3RS ET | S |
| 3-Dec-18 | NWL | 3 | 1.200 | WINTER | 32166 | 3RS ET | S |
| 4-Dec-18 | SWL | 1 | 1.500 | WINTER | 32166 | 3RS ET | P |
| 4-Dec-18 | SWL | 2 | 53.480 | WINTER | 32166 | 3RS ET | P |
| 4-Dec-18 | SWL | 2 | 13.410 | WINTER | 32166 | 3RS ET | S |
| 6-Dec-18 | NEL | 2 | 31.662 | WINTER | 32166 | 3RS ET | P |
| 6-Dec-18 | NEL | 3 | 5.158 | WINTER | 32166 | 3RS ET | P |
| 6-Dec-18 | NEL | 2 | 9.300 | WINTER | 32166 | 3RS ET | S |
| 6-Dec-18 | NEL | 3 | 1.080 | WINTER | 32166 | 3RS ET | S |
| 7-Dec-18 | NEL | 2 | 25.400 | WINTER | 32166 | 3RS ET | P |
| 7-Dec-18 | NEL | 3 | 11.810 | WINTER | 32166 | 3RS ET | P |
| 7-Dec-18 | NEL | 2 | 5.200 | WINTER | 32166 | 3RS ET | S |
| 7-Dec-18 | NEL | 3 | 4.890 | WINTER | 32166 | 3RS ET | S |
| 17-Dec-18 | NWL | 2 | 9.700 | WINTER | 32166 | 3RS ET | P |
| 17-Dec-18 | NWL | 3 | 50.000 | WINTER | 32166 | 3RS ET | P |
| 17-Dec-18 | NWL | 4 | 3.700 | WINTER | 32166 | 3RS ET | P |
| 17-Dec-18 | NWL | 2 | 3.400 | WINTER | 32166 | 3RS ET | S |
| 17-Dec-18 | NWL | 3 | 9.000 | WINTER | 32166 | 3RS ET | S |
| 18-Dec-18 | SWL | 2 | 13.300 | WINTER | 32166 | 3RS ET | P |
| 18-Dec-18 | SWL | 3 | 19.310 | WINTER | 32166 | 3RS ET | P |
| 18-Dec-18 | SWL | 4 | 6.734 | WINTER | 32166 | 3RS ET | P |
| 18-Dec-18 | SWL | 5 | 15.820 | WINTER | 32166 | 3RS ET | P |
| 18-Dec-18 | SWL | 2 | 1.300 | WINTER | 32166 | 3RS ET | S |
| 18-Dec-18 | SWL | 3 | 9.990 | WINTER | 32166 | 3RS ET | S |
| 18-Dec-18 | SWL | 4 | 2.406 | WINTER | 32166 | 3RS ET | S |
| 18-Dec-18 | SWL | 5 | 2.140 | WINTER | 32166 | 3RS ET | S |
| 20-Dec-18 | AW | 2 | 4.680 | WINTER | 32166 | 3RS ET | P |
| 20-Dec-18 | WL | 1 | 1.360 | WINTER | 32166 | 3RS ET | P |
| 20-Dec-18 | WL | 2 | 18.841 | WINTER | 32166 | 3RS ET | P |
| 20-Dec-18 | WL | 2 | 10.999 | WINTER | 32166 | 3RS ET | S |
| 21-Dec-18 | AW | 1 | 4.800 | WINTER | 32166 | 3RS ET | P |
| 21-Dec-18 | WL | 1 | 1.990 | WINTER | 32166 | 3RS ET | P |
| 21-Dec-18 | WL | 2 | 12.080 | WINTER | 32166 | 3RS ET | P |
| 21-Dec-18 | WL | 3 | 4.200 | WINTER | 32166 | 3RS ET | P |
| 21-Dec-18 | WL | 4 | 0.800 | WINTER | 32166 | 3RS ET | P |
| 21-Dec-18 | WL | 1 | 1.370 | WINTER | 32166 | 3RS ET | S |
| 21-Dec-18 | WL | 2 | 5.760 | WINTER | 32166 | 3RS ET | S |
| 21-Dec-18 | WL | 3 | 1.900 | WINTER | 32166 | 3RS ET | S |
| 21-Dec-18 | WL | 4 | 1.200 | WINTER | 32166 | 3RS ET | S |

CWD Small Vessel Line-transect Survey

Sighting Data

| DATE | STG # | TIME | CWD/FP | GP SZ | AREA | BEAU | PSD | EFFORT | TYPE | DEC LAT | DEC LON | SEASON | BOAT ASSOC. | P/S |
|-----------|-------|------|--------|-------|------|------|-----|--------|--------|---------|----------|--------|-------------|-----|
| 4-Oct-18 | 1 | 1104 | CWD | 3 | WL | 3 | 461 | ON | 3RS ET | 22.2411 | 113.8415 | AUTUMN | NONE | P |
| 4-Oct-18 | 2 | 1148 | CWD | 1 | WL | 3 | 2 | ON | 3RS ET | 22.2319 | 113.8356 | AUTUMN | NONE | P |
| 4-Oct-18 | 3 | 1210 | CWD | 3 | WL | 3 | 325 | ON | 3RS ET | 22.2232 | 113.8283 | AUTUMN | NONE | P |
| 4-Oct-18 | 4 | 1253 | CWD | 2 | WL | 3 | 49 | ON | 3RS ET | 22.2029 | 113.8235 | AUTUMN | NONE | S |
| 4-Oct-18 | 5 | 1314 | CWD | 7 | WL | 4 | 214 | ON | 3RS ET | 22.1965 | 113.8380 | AUTUMN | NONE | P |
| 5-Oct-18 | 1 | 1038 | CWD | 3 | NWL | 3 | 182 | ON | 3RS ET | 22.2805 | 113.8703 | AUTUMN | NONE | P |
| 8-Oct-18 | 1 | 0948 | CWD | 6 | NWL | 3 | 860 | ON | 3RS ET | 22.3855 | 113.8703 | AUTUMN | NONE | P |
| 8-Oct-18 | 2 | 1201 | CWD | 1 | NWL | 2 | 59 | ON | 3RS ET | 22.3717 | 113.8774 | AUTUMN | NONE | P |
| 8-Oct-18 | 3 | 1223 | CWD | 4 | NWL | 2 | 196 | ON | 3RS ET | 22.3923 | 113.8781 | AUTUMN | NONE | P |
| 8-Oct-18 | 4 | 1410 | CWD | 1 | NWL | 2 | 116 | ON | 3RS ET | 22.3887 | 113.8980 | AUTUMN | NONE | P |
| 8-Oct-18 | 5 | 1423 | CWD | 2 | NWL | 2 | 15 | ON | 3RS ET | 22.3897 | 113.8979 | AUTUMN | NONE | P |
| 12-Oct-18 | 1 | 1210 | CWD | 1 | NEL | 2 | 18 | ON | 3RS ET | 22.3219 | 113.9658 | AUTUMN | NONE | P |
| 24-Oct-18 | 1 | 1033 | CWD | 5 | WL | 3 | 264 | ON | 3RS ET | 22.2690 | 113.8447 | AUTUMN | NONE | S |
| 24-Oct-18 | 2 | 1054 | CWD | 6 | WL | 3 | 300 | ON | 3RS ET | 22.2690 | 113.8459 | AUTUMN | NONE | P |
| 26-Oct-18 | 1 | 1236 | FP | 1 | SWL | 2 | 55 | ON | 3RS ET | 22.1571 | 113.8774 | AUTUMN | NONE | S |
| 6-Nov-18 | 1 | 0941 | CWD | 4 | NWL | 3 | 997 | ON | 3RS ET | 22.3858 | 113.8695 | AUTUMN | NONE | P |
| 6-Nov-18 | 2 | 1202 | CWD | 7 | NWL | 2 | 259 | ON | 3RS ET | 22.3897 | 113.8781 | AUTUMN | NONE | P |
| 12-Nov-18 | 1 | 1036 | CWD | 2 | NWL | 2 | 635 | ON | 3RS ET | 22.2857 | 113.8701 | AUTUMN | NONE | P |
| 12-Nov-18 | 2 | 1145 | CWD | 2 | NWL | 3 | 4 | ON | 3RS ET | 22.3678 | 113.8780 | AUTUMN | NONE | P |
| 16-Nov-18 | 1 | 1038 | CWD | 4 | WL | 3 | 60 | ON | 3RS ET | 22.2604 | 113.8462 | AUTUMN | NONE | P |
| 16-Nov-18 | 2 | 1059 | CWD | 3 | WL | 2 | 131 | ON | 3RS ET | 22.2502 | 113.8359 | AUTUMN | NONE | P |
| 16-Nov-18 | 3 | 1144 | CWD | 3 | WL | 3 | 783 | ON | 3RS ET | 22.2300 | 113.8381 | AUTUMN | NONE | S |
| 16-Nov-18 | 4 | 1219 | CWD | 1 | WL | 2 | 20 | ON | 3RS ET | 22.2233 | 113.8273 | AUTUMN | NONE | P |
| 16-Nov-18 | 5 | 1223 | CWD | 3 | WL | 2 | 244 | ON | 3RS ET | 22.2237 | 113.8249 | AUTUMN | NONE | P |
| 16-Nov-18 | 6 | 1237 | CWD | 1 | WL | 3 | 170 | ON | 3RS ET | 22.2144 | 113.8230 | AUTUMN | NONE | P |
| 16-Nov-18 | 7 | 1243 | CWD | 2 | WL | 3 | 413 | ON | 3RS ET | 22.2146 | 113.8296 | AUTUMN | NONE | P |
| 16-Nov-18 | 8 | 1300 | CWD | 8 | WL | 3 | 103 | ON | 3RS ET | 22.2054 | 113.8384 | AUTUMN | NONE | P |
| 16-Nov-18 | 9 | 1322 | CWD | 3 | WL | 3 | 171 | ON | 3RS ET | 22.2000 | 113.8254 | AUTUMN | NONE | S |
| 16-Nov-18 | 10 | 1345 | CWD | 2 | WL | 3 | 77 | ON | 3RS ET | 22.1963 | 113.8401 | AUTUMN | NONE | P |
| 20-Nov-18 | 1 | 1058 | CWD | 3 | WL | 2 | 127 | ON | 3RS ET | 22.2413 | 113.8401 | AUTUMN | NONE | P |
| 20-Nov-18 | 2 | 1210 | CWD | 4 | WL | 2 | N/A | OFF | 3RS ET | 22.2234 | 113.8330 | AUTUMN | NONE | P |







| DATE | STG # | TIME | CWD/FP | GP SZ | AREA | BEAU | PSD | EFFORT | TYPE | DEC LAT | DEC LON | SEASON | BOAT ASSOC. | P/S |
|-----------|-------|------|--------|-------|------|------|-----|--------|--------|---------|----------|--------|-------------|-----|
| 20-Nov-18 | 3 | 1226 | CWD | 4 | WL | 3 | 7 | ON | 3RS ET | 22.2230 | 113.8315 | AUTUMN | NONE | P |
| 20-Nov-18 | 4 | 1244 | CWD | 2 | WL | 3 | 495 | ON | 3RS ET | 22.2227 | 113.8233 | AUTUMN | NONE | P |
| 21-Nov-18 | 1 | 1450 | CWD | 1 | SWL | 3 | 354 | ON | 3RS ET | 22.1994 | 113.8604 | AUTUMN | NONE | S |
| 21-Nov-18 | 2 | 1516 | CWD | 1 | SWL | 2 | 339 | ON | 3RS ET | 22.1757 | 113.8489 | AUTUMN | NONE | P |
| 21-Nov-18 | 3 | 1532 | CWD | 1 | SWL | 2 | N/A | OFF | 3RS ET | 22.1869 | 113.8490 | AUTUMN | NONE | P |
| 23-Nov-18 | 1 | 1320 | FP | 2 | SWL | 2 | 52 | ON | 3RS ET | 22.1551 | 113.9041 | AUTUMN | NONE | S |
| 3-Dec-18 | 1 | 1039 | CWD | 2 | NWL | 2 | 178 | ON | 3RS ET | 22.2718 | 113.8723 | WINTER | NONE | S |
| 3-Dec-18 | 2 | 1302 | CWD | 1 | NWL | 3 | 21 | ON | 3RS ET | 22.3659 | 113.8976 | WINTER | NONE | P |
| 4-Dec-18 | 1 | 1442 | CWD | 10 | SWL | 2 | 210 | ON | 3RS ET | 22.2007 | 113.8657 | WINTER | NONE | S |
| 4-Dec-18 | 2 | 1533 | CWD | 2 | SWL | 2 | 541 | ON | 3RS ET | 22.1810 | 113.8491 | WINTER | NONE | P |
| 18-Dec-18 | 1 | 1315 | FP | 2 | SWL | 3 | 4 | ON | 3RS ET | 22.1552 | 113.9043 | WINTER | NONE | S |
| 18-Dec-18 | 2 | 1419 | FP | 3 | SWL | 5 | 112 | ON | 3RS ET | 22.1667 | 113.9268 | WINTER | NONE | P |
| 20-Dec-18 | 1 | 1136 | CWD | 1 | WL | 2 | 34 | ON | 3RS ET | 22.2138 | 113.8278 | WINTER | NONE | P |
| 21-Dec-18 | 1 | 1143 | CWD | 11 | WL | 3 | 170 | ON | 3RS ET | 22.2053 | 113.8303 | WINTER | NONE | P |
| 21-Dec-18 | 2 | 1218 | CWD | 7 | WL | 3 | 244 | ON | 3RS ET | 22.1872 | 113.8315 | WINTER | NONE | P |

Abbreviations: STG# = Sighting Number; GP SZ = Group Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance (in metres); N/A = Not Applicable; DEC LAT = Latitude (WGS84 in Decimal), DEC LON = Longitude (WGS84 in Decimal); BOAT ASSOC. = Fishing Boat Association

Sighting data of finless porpoise (FP) are presented for reference only. No relevant figure or text will be mentioned in the quarterly EM&A report. All FP sightings are excluded in calculation.

CWD Small Vessel Line-transect Survey

Photo Identification

| | |
|---|--|
|  |  |
| NLMM002 | NLMM004 |
|  |  |
| NLMM006 | NLMM012 |
|  |  |
| NLMM013 | NLMM015 |



NLMM018



NLMM019



NLMM020



NLMM023



NLMM037



NLMM039



NLMM040



NLMM041



NLMM043



NLMM052



NLMM058



NLMM059



NLMM063



NLMM068



SLMM003



SLMM007



SLMM010



SLMM012



SLMM014



SLMM019



SLMM022



SLMM027



SLMM028



SLMM030



SLMM034



SLMM037



SLMM044



SLMM052



SLMM053



SLMM059



SLMM067



WLMM001



WLMM007



WLMM018



WLMM019



WLMM028



WLMM029



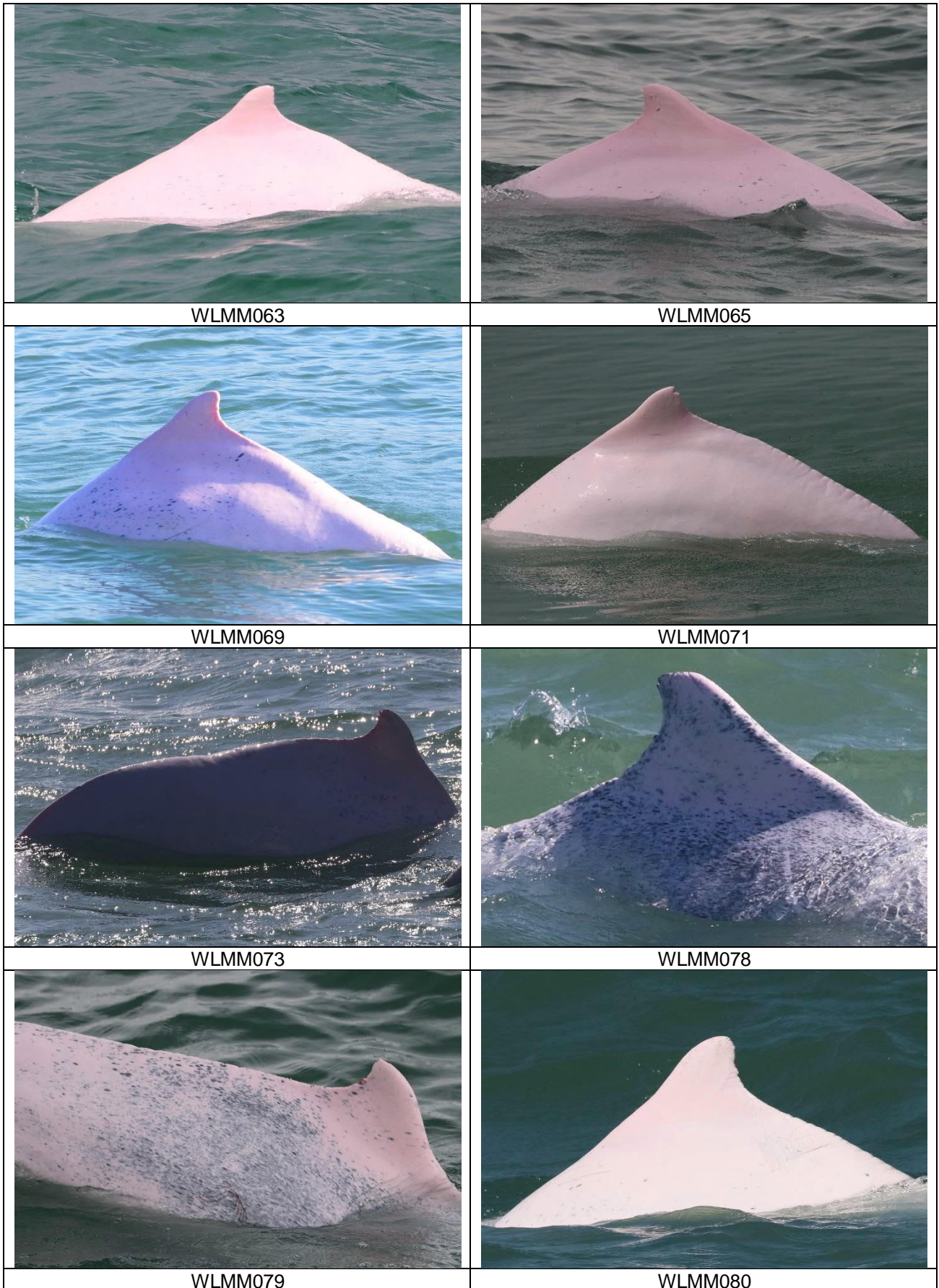
WLMM043



WLMM056



WLMM060





WLMM089



WLMM109



WLMM114



WLMM119



WLMM125



WLMM127



WLMM130 (Lower)

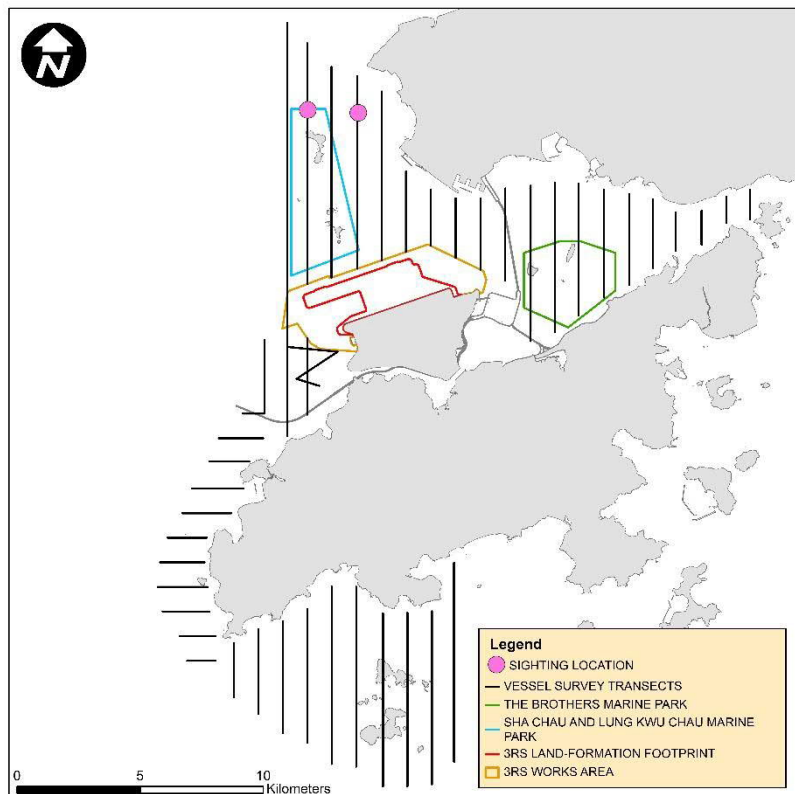


WLMM131

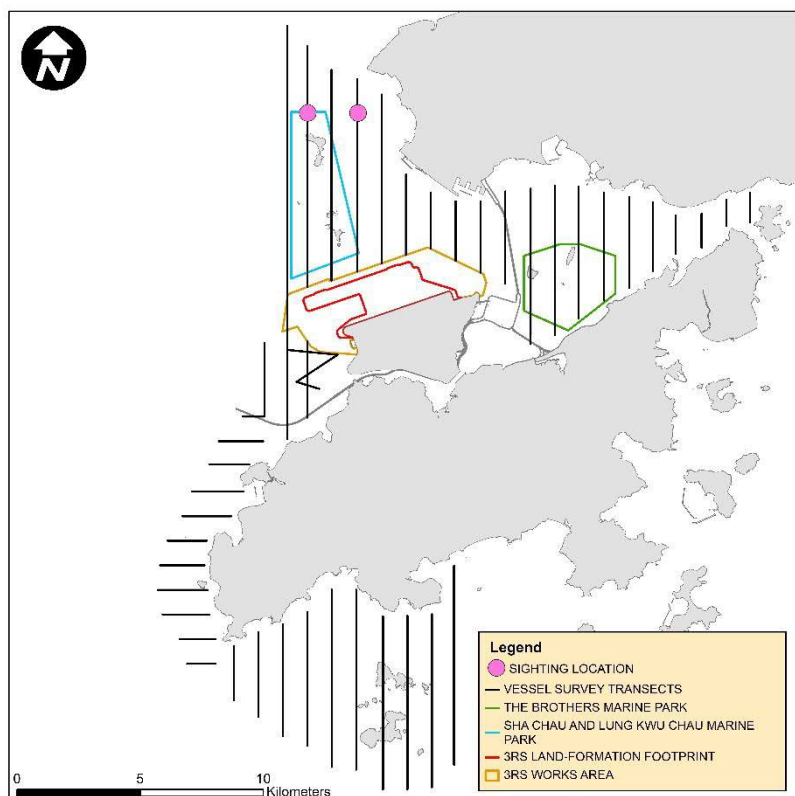
CWD Small Vessel Line-transect Survey

Photo Identification – Re-sighting Locations

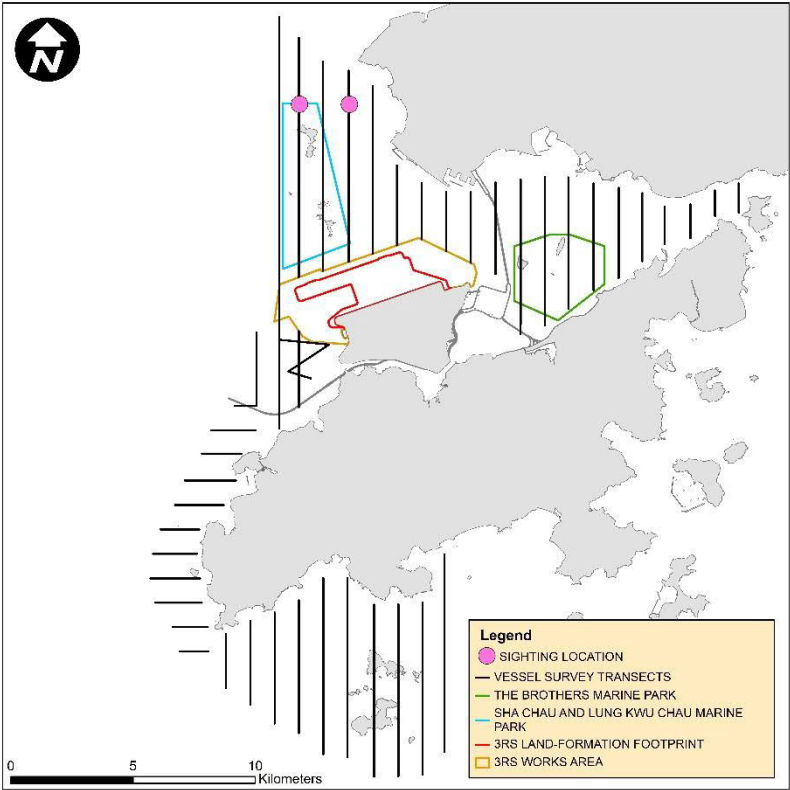
NLMM004



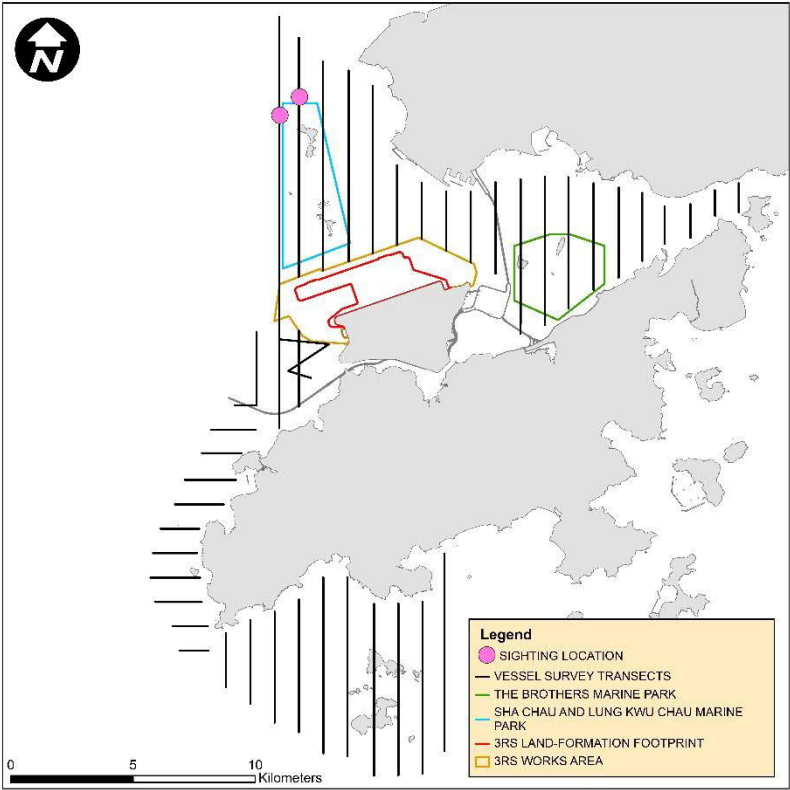
NLMM006



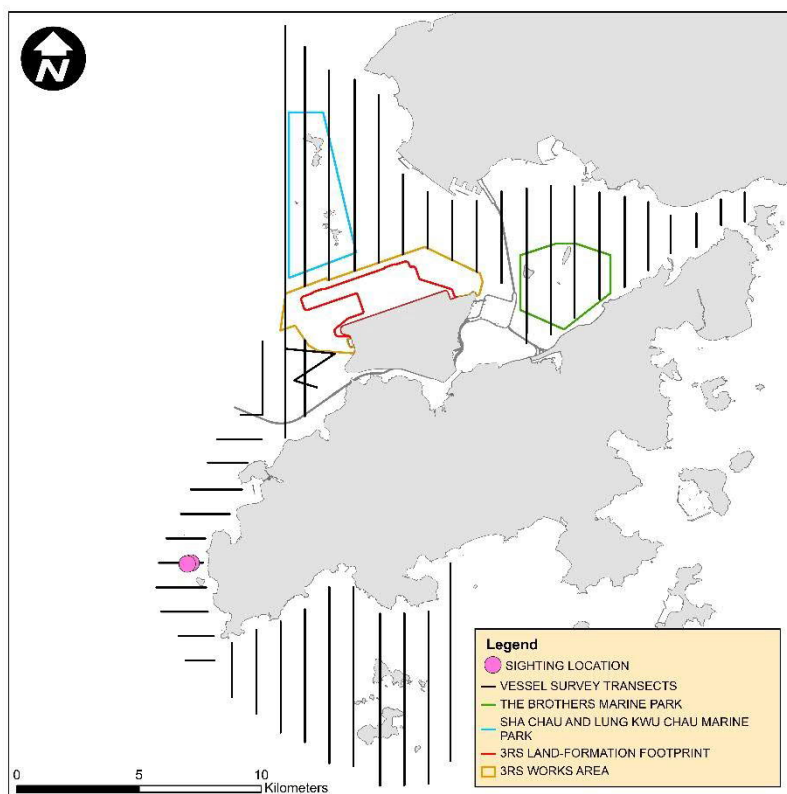
NLMM013



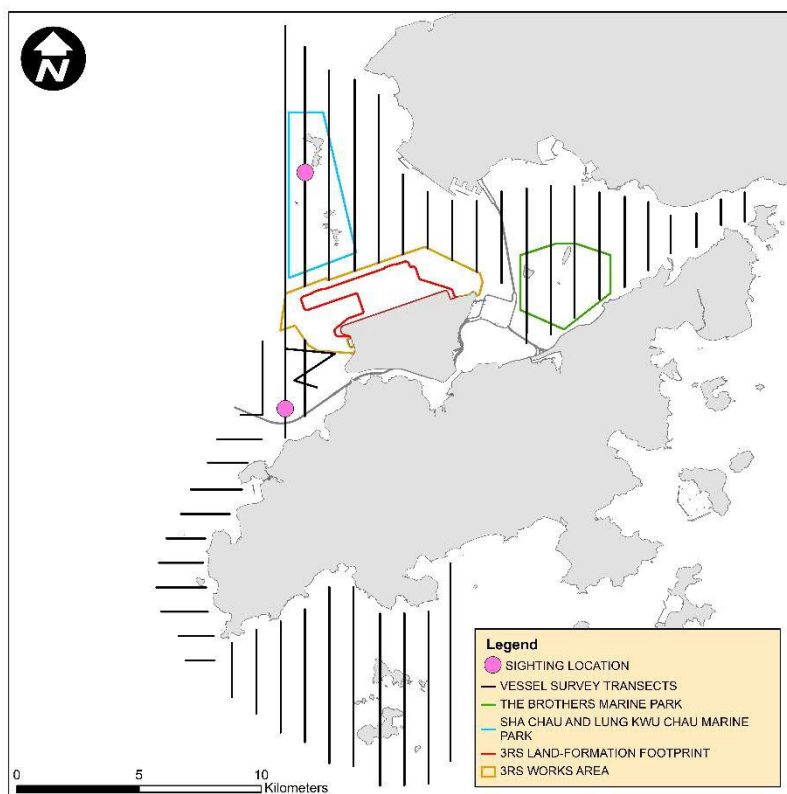
NLMM015



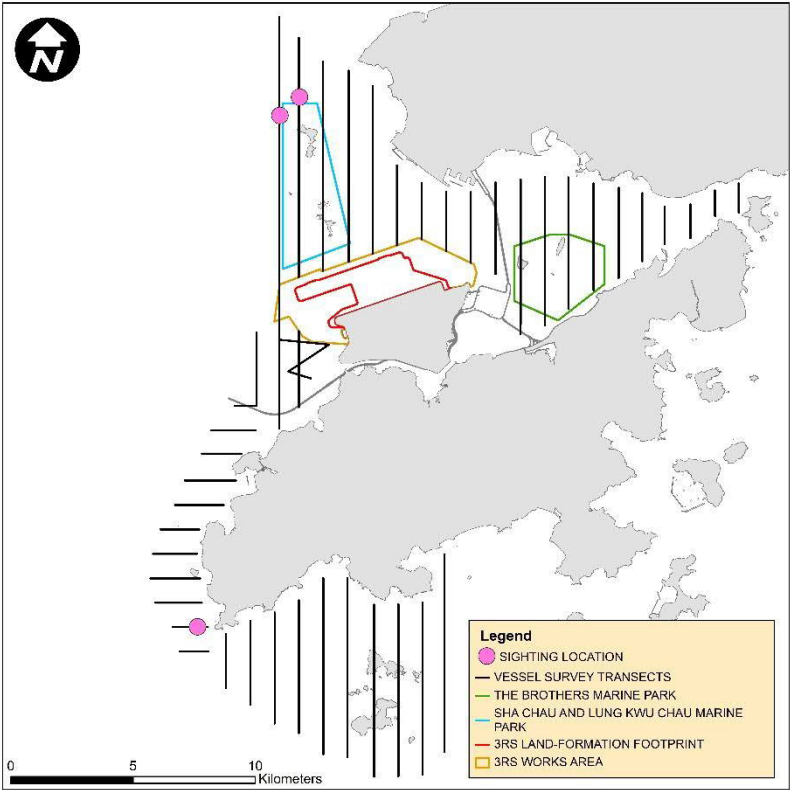
NLMM018



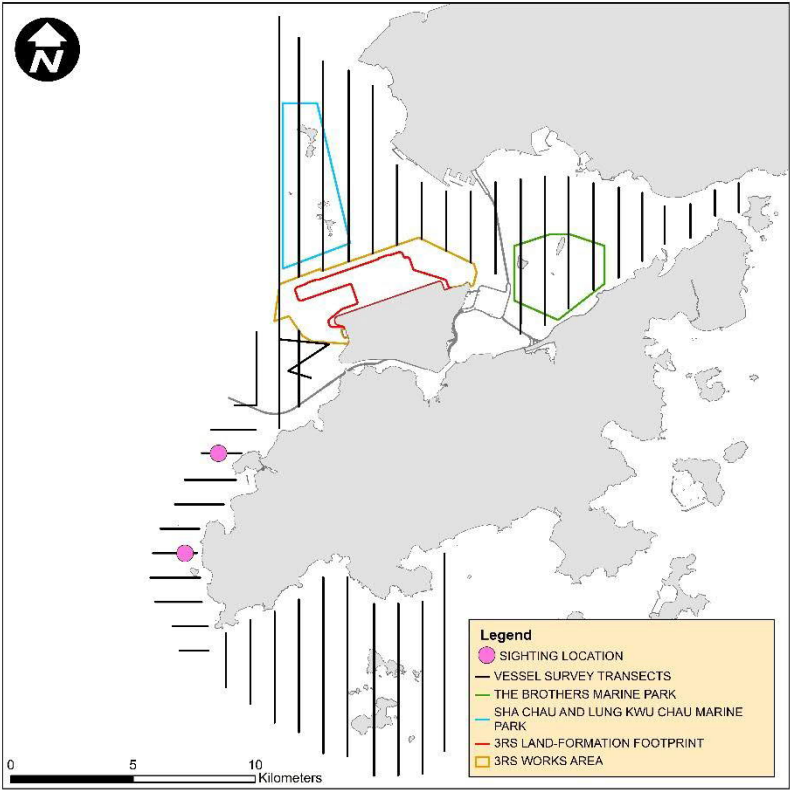
NLMM023



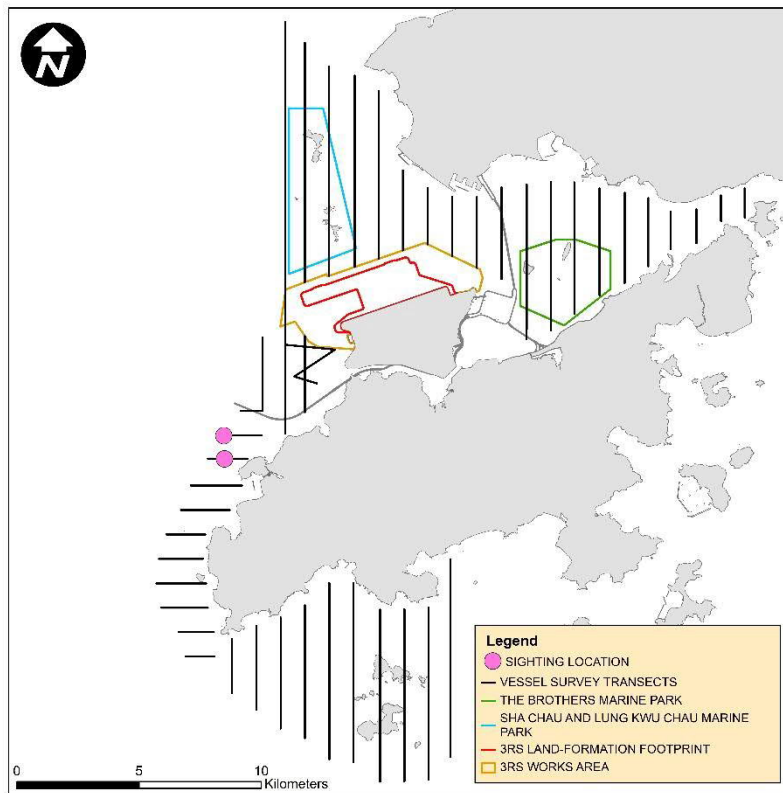
NLMM063



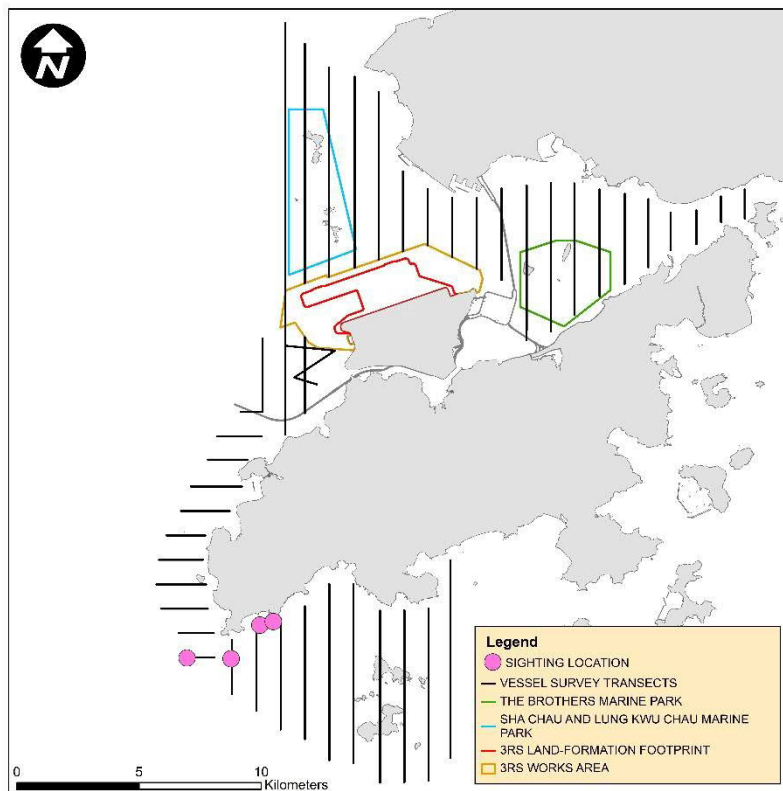
SLMM003



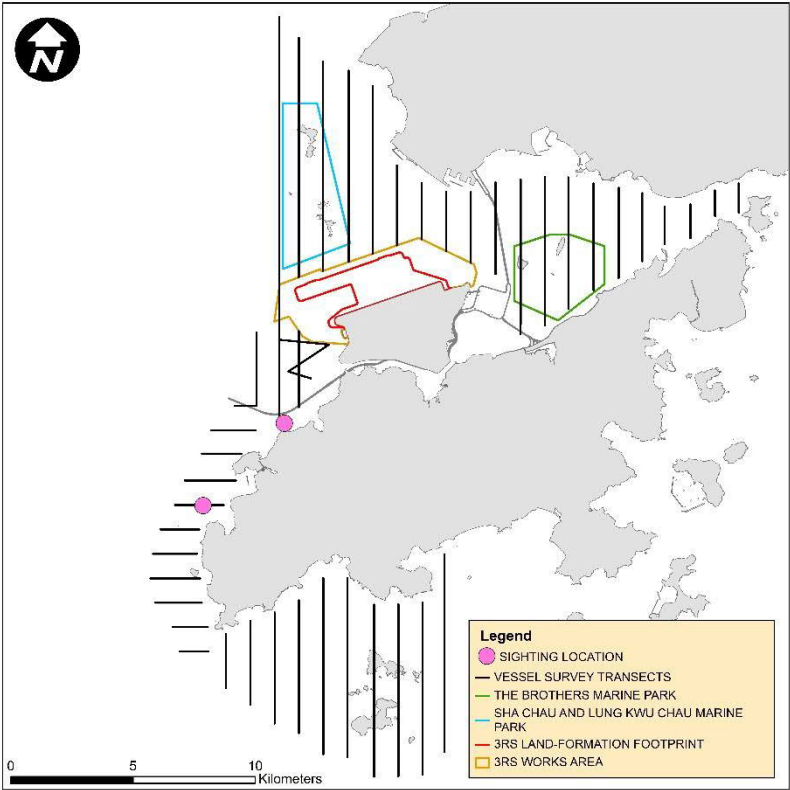
SLMM007



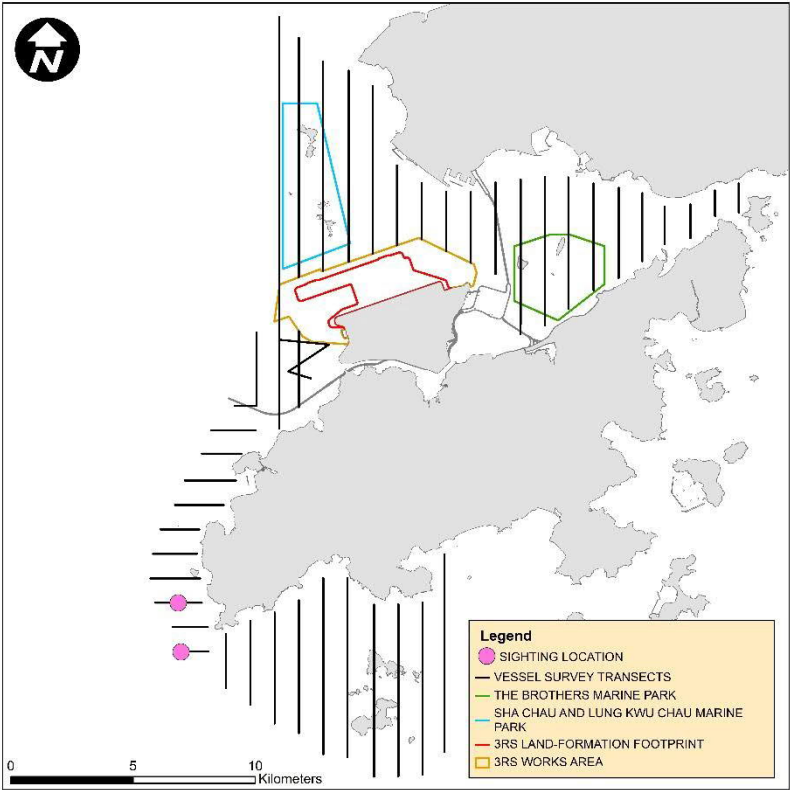
SLMM014



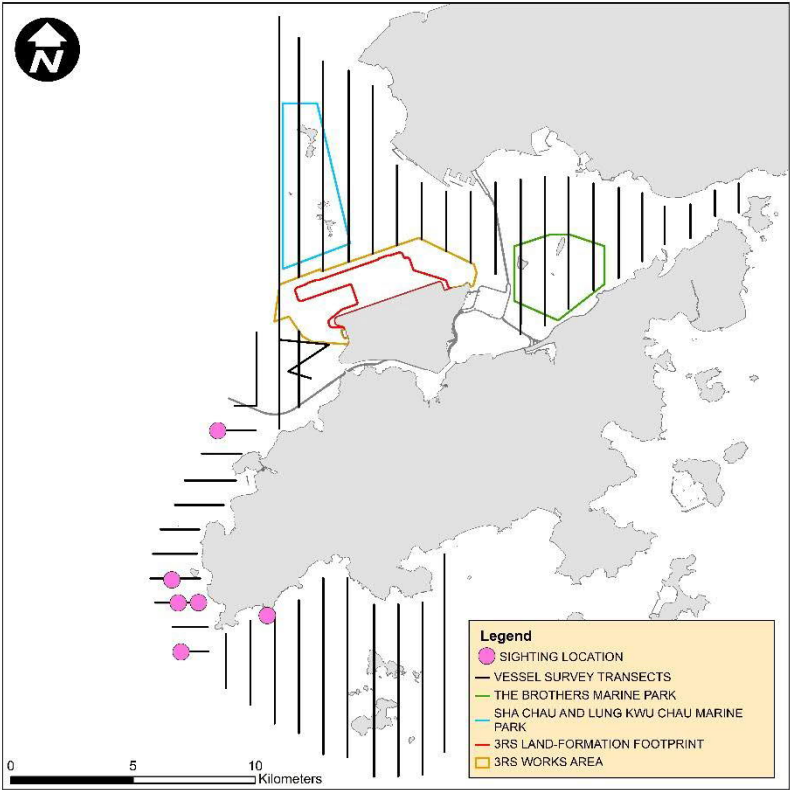
SLMM028



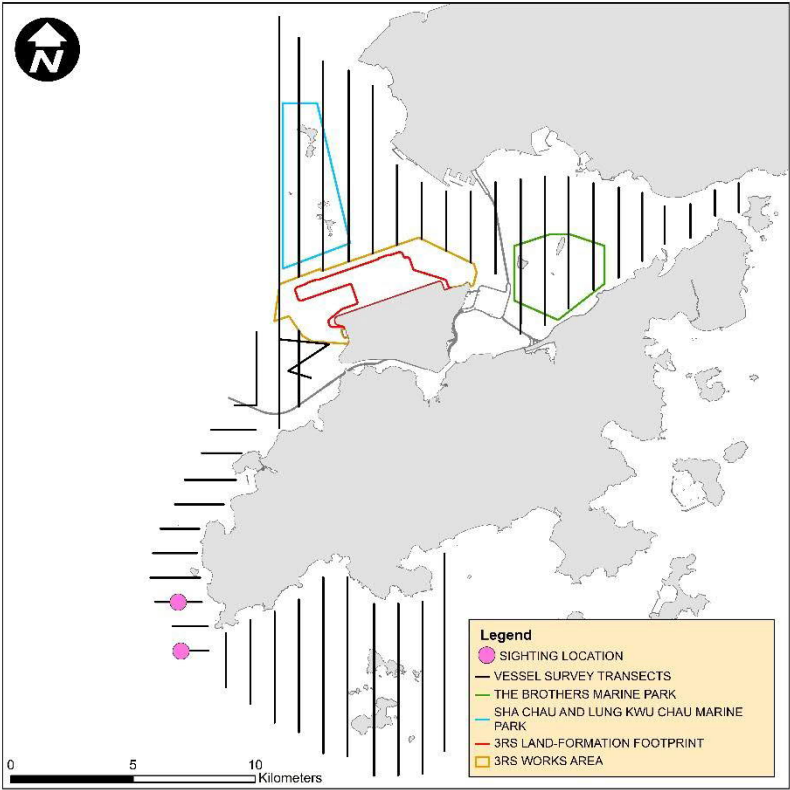
SLMM053



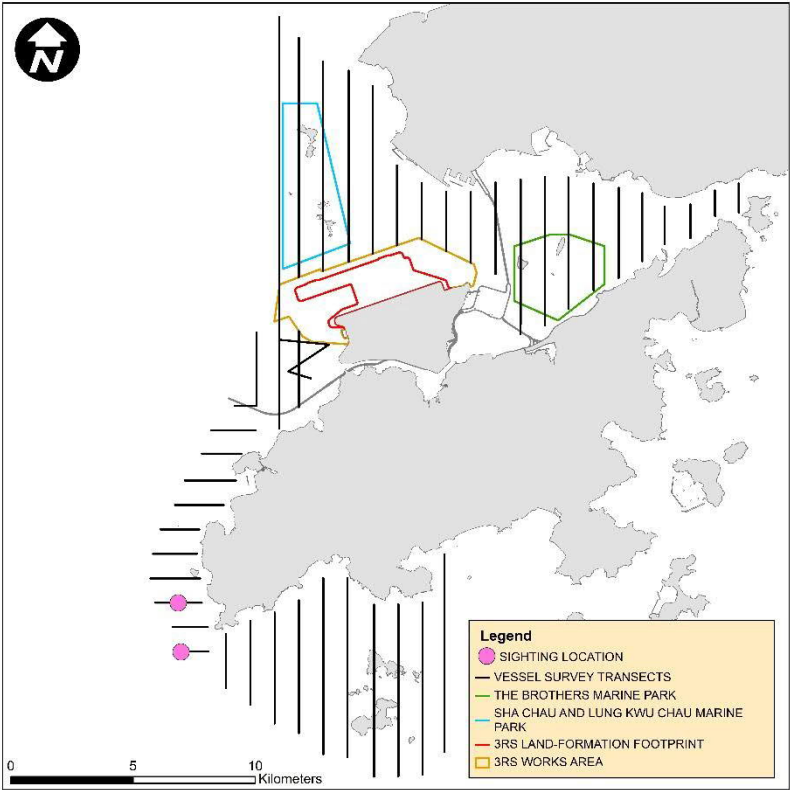
WLMM001



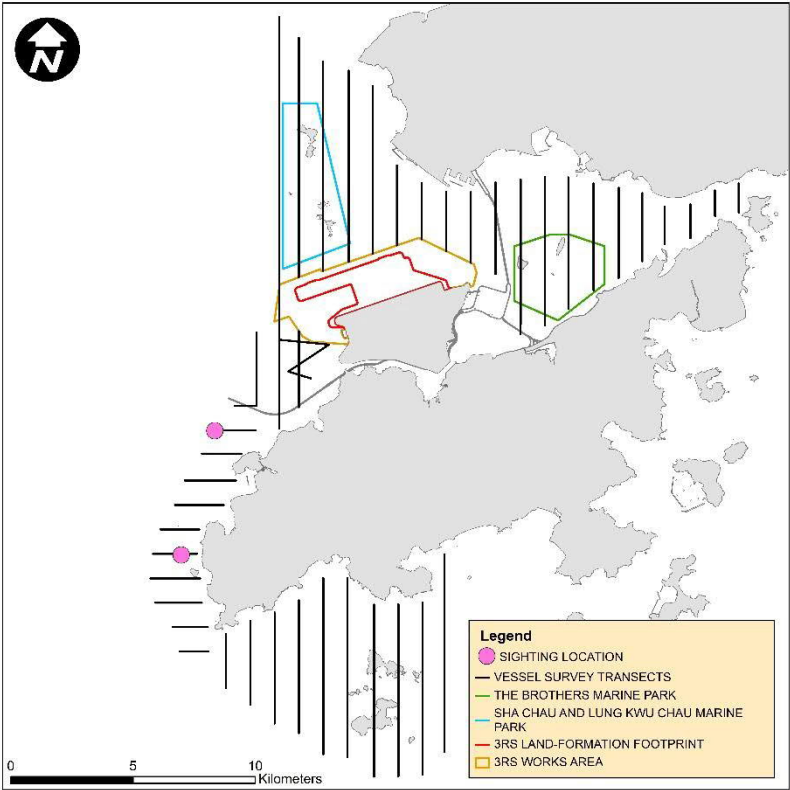
WLMM028



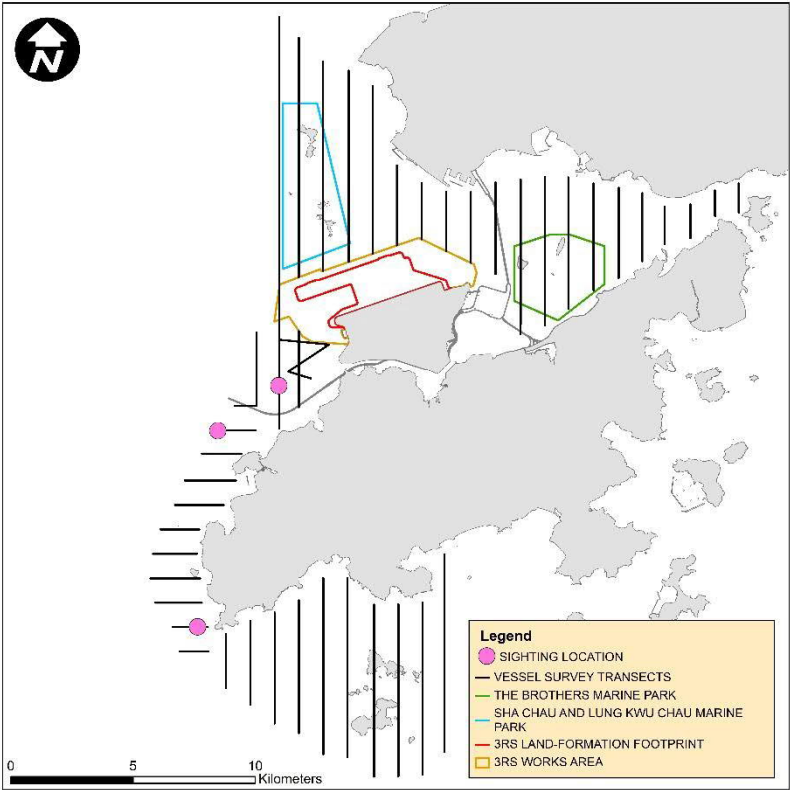
WLMM029



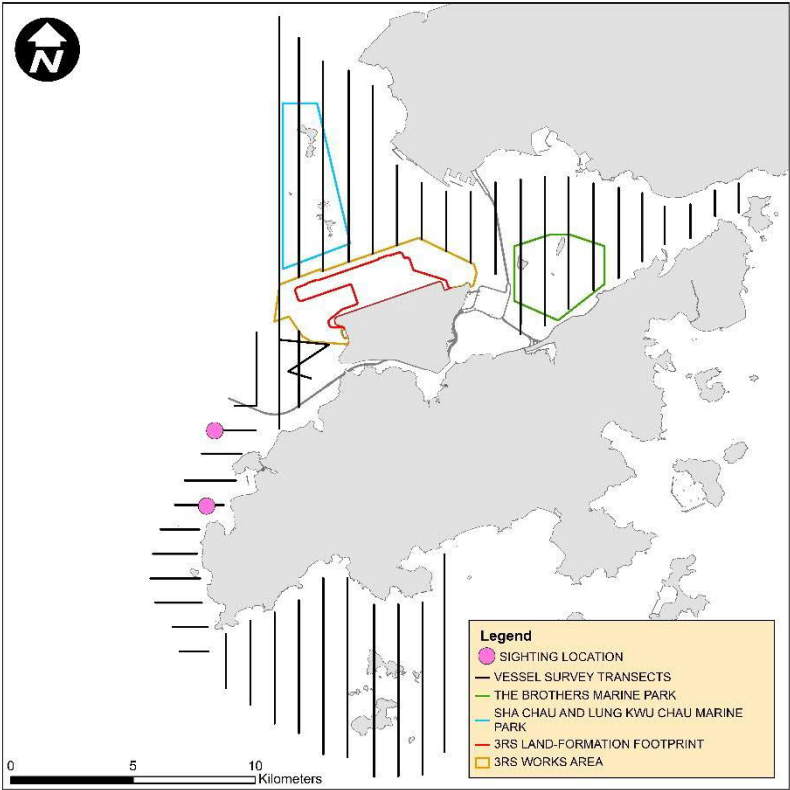
WLMM056



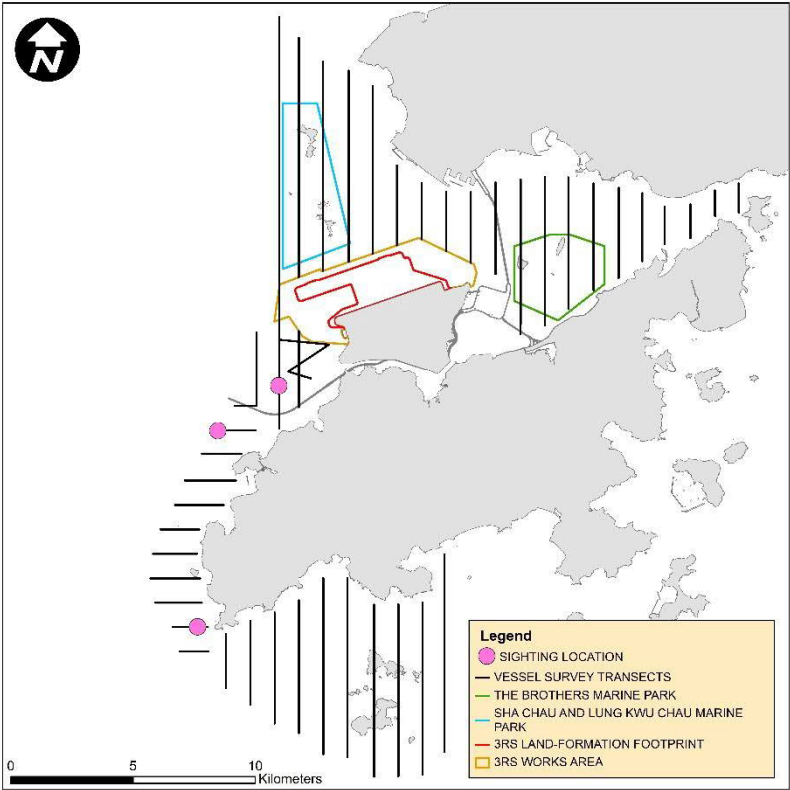
WLMM060



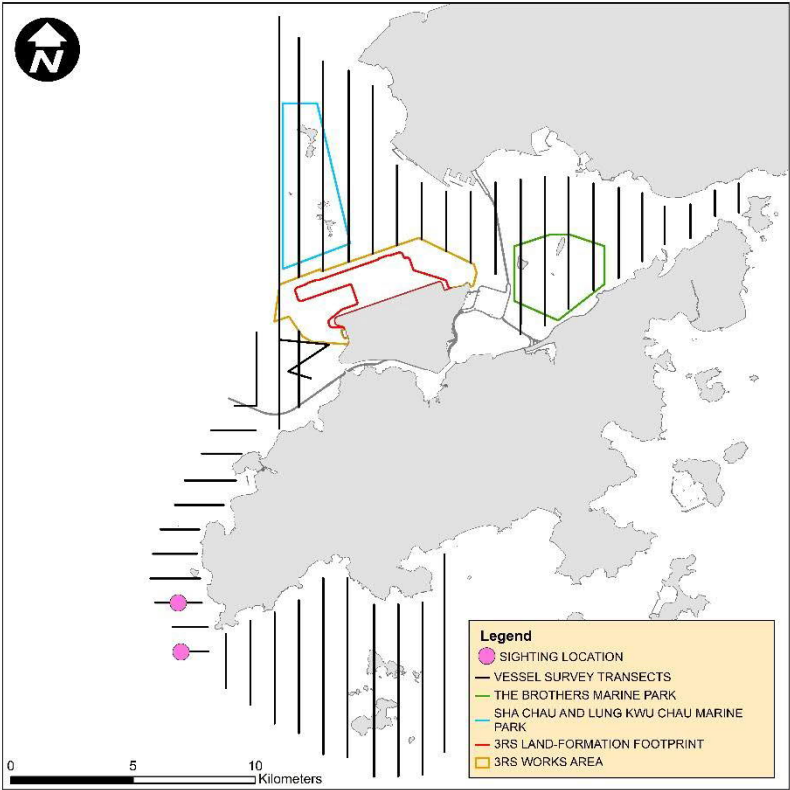
WLMM065



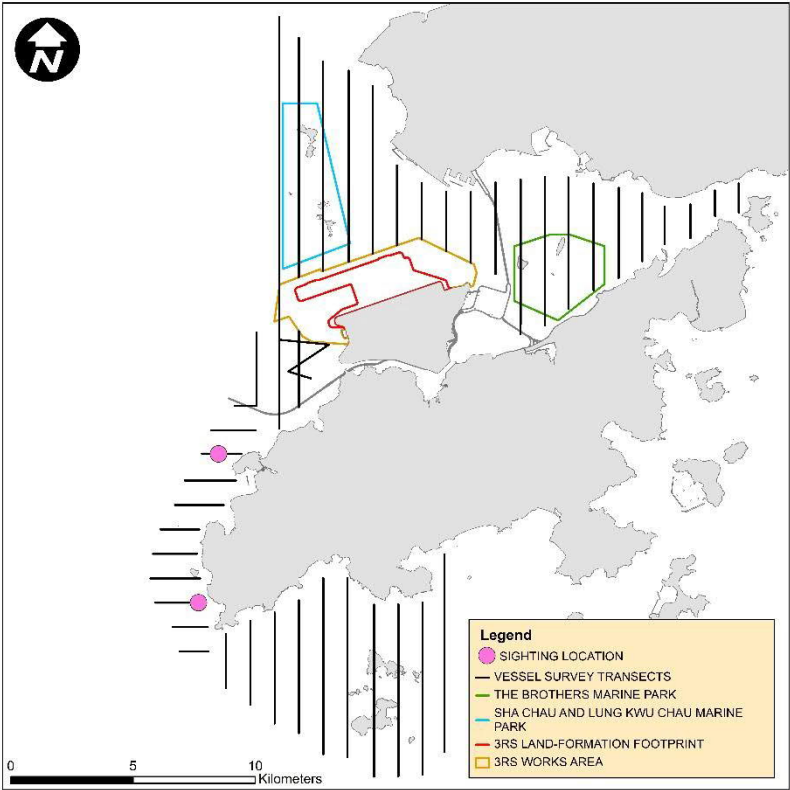
WLMM071



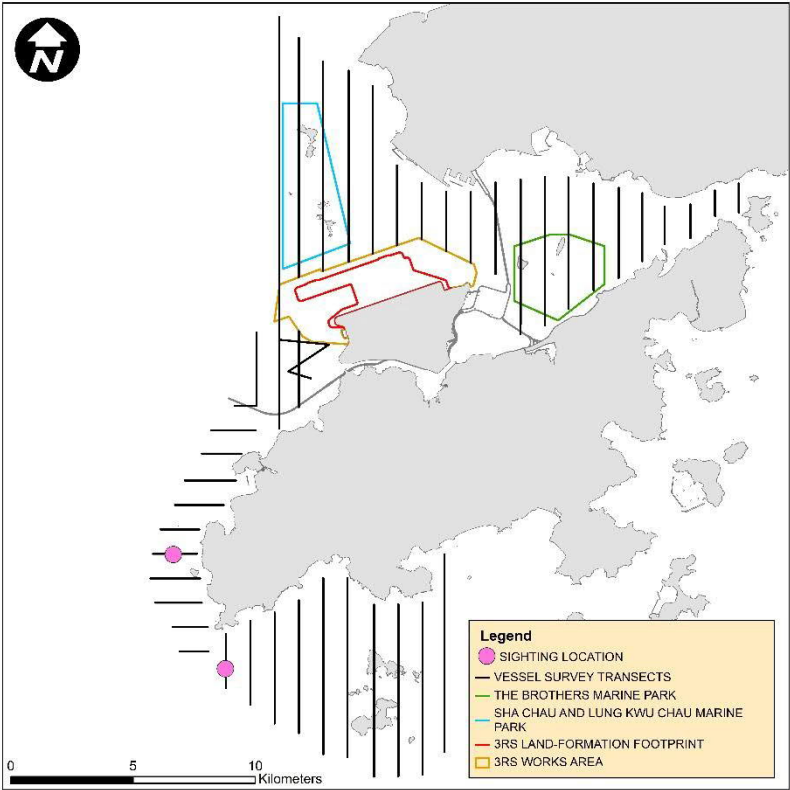
WLMM078



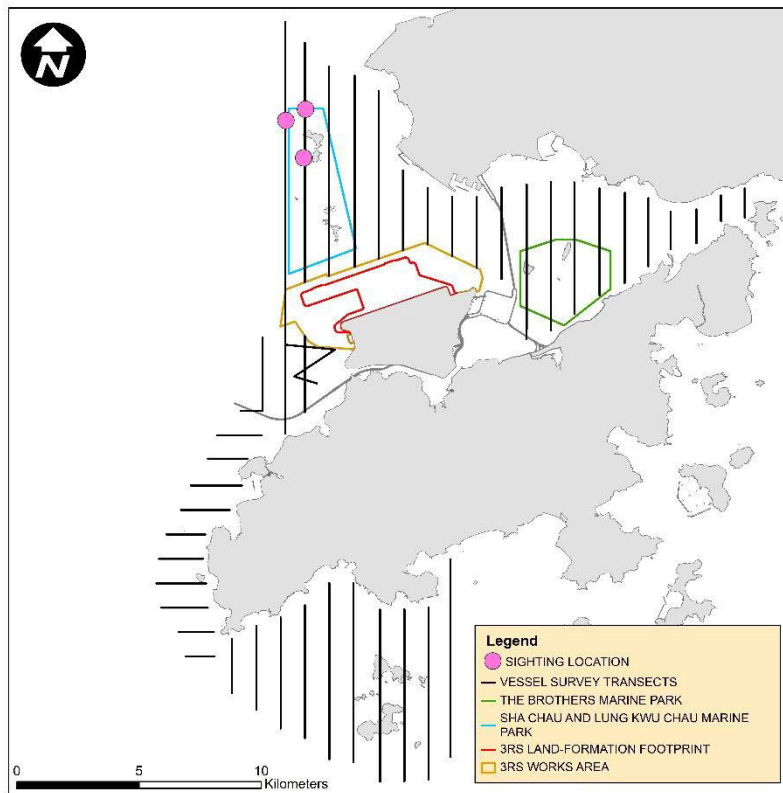
WLMM079



WLMM114



WLMM127



CWD Land-based Theodolite Tracking**CWD Groups by Survey Date**

| Date | Station | Start | End | Duration | Beaufort | Visibility | No. of Focal Follow | Dolphin Group Size |
|-----------|---------------|-------|-------|----------|----------|------------|---------------------|--------------------|
| 8/Oct/18 | Sha Chau | 8:37 | 14:37 | 6:00 | 2 | 3 | 0 | N/A |
| 9/Oct/18 | Sha Chau | 8:51 | 14:51 | 6:00 | 2 | 3 | 0 | N/A |
| 15/Oct/18 | Lung Kwu Chau | 8:47 | 14:47 | 6:00 | 2 | 2 | 3 | 1-2 |
| 22/Oct/18 | Lung Kwu Chau | 8:42 | 14:42 | 6:00 | 2 | 2-3 | 4 | 1-5 |
| 20/Oct/18 | Lung Kwu Chau | 9:22 | 15:22 | 6:00 | 2-3 | 2 | 4 | 1-7 |
| 5/Nov/18 | Lung Kwu Chau | 8:50 | 14:50 | 6:00 | 2-3 | 2-3 | 6 | 1-3 |
| 13/Nov/18 | Lung Kwu Chau | 8:36 | 14:36 | 6:00 | 2-3 | 3-4 | 4 | 2-5 |
| 14/Nov/18 | Sha Chau | 8:37 | 14:37 | 6:00 | 2-3 | 2-3 | 0 | N/A |
| 21/Nov/18 | Lung Kwu Chau | 8:53 | 14:53 | 6:00 | 2-3 | 2-3 | 2 | 2-5 |
| 27/Nov/18 | Sha Chau | 8:27 | 14:27 | 6:00 | 2 | 3 | 0 | N/A |
| 10/Dec/18 | Lung Kwu Chau | 8:46 | 14:46 | 6:00 | 2 | 2 | 4 | 1-3 |
| 11/Dec/18 | Sha Chau | 8:41 | 14:41 | 6:00 | 2-3 | 2 | 0 | N/A |
| 14/Dec/18 | Sha Chau | 8:43 | 14:43 | 6:00 | 2 | 2 | 0 | N/A |
| 18/Dec/18 | Lung Kwu Chau | 8:40 | 14:40 | 6:00 | 2-3 | 1 | 2 | 3-4 |
| 19/Dec/18 | Lung Kwu Chau | 8:43 | 14:43 | 6:00 | 2-3 | 1-2 | 2 | 3-5 |

Visibility: 1=Excellent, 2=Good, 3=Fair, 4=Poor

Terrestrial Ecological Monitoring

Terrestrial Ecological Monitoring – location map and site photos regarding the monthly ecological monitoring for the egretty area on Sheung Sha Chau and the HDD daylighting location



October 2018

Photo record of View 1



Photo record of View 2



November 2018

Photo record of View 1



Photo record of View 2



December 2018

Photo record of View 1



Photo record of View 2

